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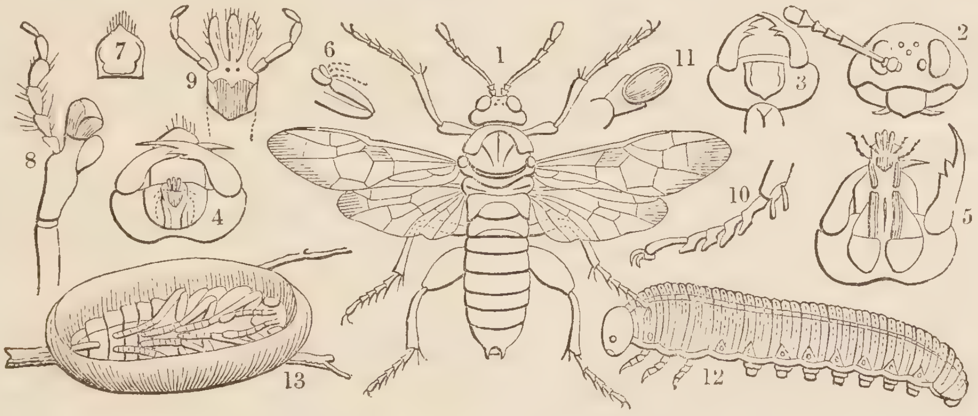

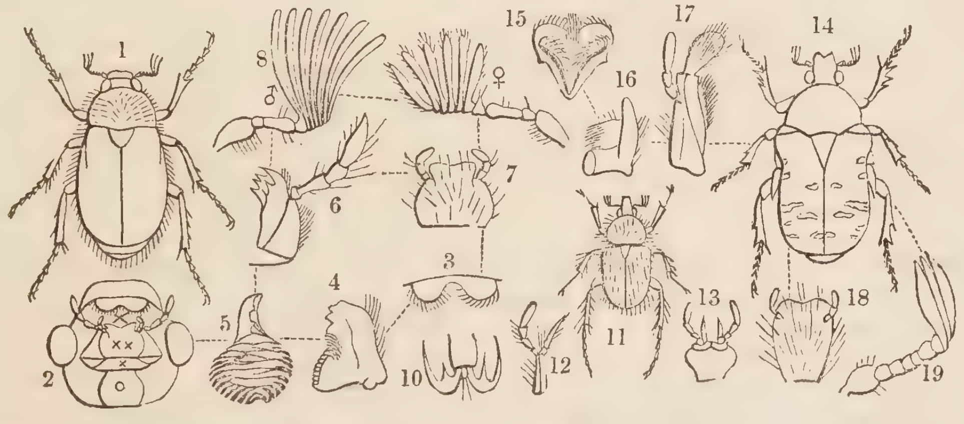

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CONTENTS OF PART V.

PAGE
HEART—TREATMENT OF HYPERTROPHY OF - - - 209
HEART—Of Dilatation of its Chambers and Orifices - - - - 210
HEART—Of Atrophy of - - 213
HEART—Contractions of - - 214
HEART—Alterations of its Consistence and Colour - - - - 215
HEART—Of Serous and Sanguineous Infiltrations of - - - - 215
HEART—Of Fatty Degenerations of - 216
HEART AND PERICARDIUM—Of Adventitious Formations in - - 217
HEART—Of Polypous Concretions in its Cavities - - - - 220
HEART—Of Ruptures of - - 222
HEART—Alterations of its Bloodvessels - 225
HEART—Communication between the Sides of - - - - 225
HEART—Displacement and Preternatural Positions of - - - - 226
HEART AND PERICARDIUM—Bibliography and References to - - 227
HERPETIC ERUPTIONS—Pathology of - - - - - - 230
Treatment of - - - 233
HICCUP - - - - 234
HOOPING COUGH — Symptoms and Complications of - - - 236
Pathology of - - - 240
Treatment of - - - 244
HYDATID - - - - 251
HYPERTROPHY - - - 257
HYPOCHONDRIASIS —Description and Complications of - - - 259

PAGE
HYPOCHONDRIASIS—Pathology of - 264
Treatment of - - - 266
HYSTERIC AFFECTIONS — More Regular Forms of - - - 272
Irregular and Anomalous States of - 275
Causes and Pathology of - - 282
General Treatment of - - 286
Treatment of the Irregular and Complicated States of - - - 289
Prophylactic Treatment of - - 293

JAUNDICE—Description, &c. of - 296
The Pathological Relations of - 300
Of Green, Black, and other Forms of - 303
Treatment of - - - 307

ICHTHYOSIS - - - - 312
IMPETIGINOUS AFFECTIONS - 314
IMPOTENCE AND STERILITY - 319
IMPOTENCE IN THE MALE - 320
IMPOTENCE AND STERILITY IN THE FEMALE - - - 322
INDIGESTION—Simple Asthenic - 326
INDIGESTION—Irritative States of - 328
INDIGESTION — Associated and Sympathetic Affections of - - 330
INDIGESTION—Pathology, &c. of - 332
INDIGESTION—Medical Treatment of 335
INDIGESTION—Of the Diet and Regimen in - - - 338
INDURATION - - - 344
INFECTION - - - 345
INFECTIONS—Classification of - 347
INFECTION—Sources and Proofs of - *ib.*
INFECTION—Diseases produced by - 352

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and discrimination, or they may be injurious. — Laennec and Bouillaud advise bloodletting and other reducing and tranquillising means, in the manner recommended by Albertini and Valsalva, and to a decided extent. But I agree with Dr. Hope, in considering these measures hazardous, and often injurious, when pushed as far as these writers direct. — M. Laennec, especially, insists upon copious depletion at the commencement of the complaint, — upon a repetition of it every two, four, or eight days, until the palpitations cease, and the heart gives only a moderate impulse, — upon spare diet, with very little or no animal food, — and upon physical and mental repose. If the treatment is not commenced until hypertrophy has occasioned dyspnœa, dropsical effusions, œdema of the lungs, &c., he still advises bleeding and abstinence; and, in all cases, a perseverance in this plan, especially in abstinence, for many months; and he has no confidence in a cure until the expiration of a year (if the patient live as long) of complete absence of all the symptoms and physical signs of hypertrophy. — As to *bloodletting*, the opinion of M. Bouillaud is not materially different from that of Laennec. He prescribes, for an adult of medium strength, and for a medium degree of the complaint, three or four bleedings at the arm, each consisting of twelve or sixteen ounces, followed by one or two cuppings on the præcordia of eight or twelve ounces each, in the course of the treatment. He considers *digitalis* as the next most important remedy — as the true opiate of the heart; and employs it both internally and endermically. He applies a blister on the præcordia; and he sprinkles the blistered surface with from six to fifteen grains of powdered digitalis, directing, at the same time, and long afterwards, mental and bodily repose, and a very restricted diet.

183. *a.* Respecting *bloodletting* in this malady, my experience and opinions are in accordance with those of Dr. Hope; and I consider, with him, sparing abstractions of blood, at intervals of two or three weeks or more, to be the most beneficial. More copious depletions have given temporary relief; but the symptoms have soon returned with increased violence, and carried off the patient, especially in cases where there were also dilatation and lesions of the valves or orifices of the heart. As I have shown in the article Blood (§ 58.), large depletions increase the frequency of the heart's action; and this effect is more readily produced by them when this organ is in a state of enlargement. I perfectly agree with the above writer in considering, that the indications of treatment should be to diminish the quantity, without deteriorating the quality, of the blood, and without producing reaction, or permanently enfeebling the action of the heart and the energies of the constitution, — that from four to eight ounces of blood, taken every two, three, four, or six weeks, according to the circumstances of the case, will be sufficient to fulfil this indication, to keep down inordinate action, and to relieve the dyspnœa, — that the diet should be spare, and consist of white animal food, and liquids in small quantity; and that every thing heating or stimulating, or calculated to accelerate the circulation, ought to be avoided.

184. *b.* Much benefit will result from a judicious selection of *internal medicines.* — Of these, *digitalis, colchicum,* the *sub-borate of soda, mercurial alteratives, hydriodate of potass, refrigerants* and *diuretics*, are most deserving of notice. The secretions and excretions should be freely promoted, by a mercurial alterative taken at bedtime, and a mild purgative in the morning. Equal parts of infusion of digitalis and *camphor mixture* may be also given twice or thrice a day with five or six grains of the sub-borate of soda; or small doses of *colchicum*, with an alkaline subcarbonate, may be prescribed, in an infusion of *tilea Europea*, or decoction of marsh-mallows. — Diuretics are also of service, especially the supertartrate of potash with the sub-borate of soda, in the compound decoction of broom-tops, or in a weak infusion of senega, or in camphor julap, or in the decoction of taraxacum, — the nitrate of potash or soda, with spirits of nitric æther, — and the acetate of potash, with small doses of squill, or the infusion or spirit of juniper. When dropsical effusions take place, these, varied according to the peculiarities of the case, and aided by hydrogogue purgatives, are required; and one or other of the liniments prescribed in the *Appendix* (F. 297. 311.), with the addition of a little of the hydriodate of potash, may be rubbed or applied over the thorax daily. When the breathing becomes much affected, camphor, with small doses of ipecacuanha, and with hyoscyamus, or belladonna, &c., may be tried; and when debility or irritability is urgent, camphor, conjoined with hydrocyanic acid, or with digitalis and the extract of hop, or with gentle tonics and other narcotics, as the acetate of morphia, will be very serviceable. Digitalis was much praised by Ferriar in palpitations from organic lesions; and, when hypertrophy is attended with excessive action and distressing irritability, the following will be found useful: —

No. 256. ℞ Infus. Digitalis ℥ vijss.; Potassæ Nitratis ʒ ij.; Acidi Hydrocyanici ♏ xiv.; Syrup. Aurantii ʒ ij.; Misce. Capiat æger Coch. i. amplum secundâ quâque horâ.

185. *c.* When *diseases of the valves and orifices* of the heart have been concerned in the production of hypertrophy, the treatment is not materially, if indeed at all, different from what is here advised. The fixed alkalies, especially the liquor potassæ, may be given in suitable combinations, as with digitalis, camphor, and various diuretics. The internal exhibition of the hydriodate of potash has been tried by me in several cases; but the results have not always led me to persist in the use of it in cardiac hypertrophy from this cause. It may, however, be given in small doses, with liquor potassæ: it will then not be injurious.

186. *d. External derivatives*, especially setons or issues, inserted near the margins of the false ribs, or below them, have been prescribed by me in several cases, and in some with marked advantage. In every instance, the treatment should be assiduously persisted in; and a most abstemious diet and regimen rigidly observed. Repose of mind and body, and residence in a dry and pure air, are also most beneficial. — As the features of the disease vary, so should the treatment be modified, care being taken not to reduce the vital energies too low. As soon as exhaustion appears, it ought to be met by restorative means. Where

a free discharge is procured by setons or issues — which are especially indicated when the hypertrophy has been consecutive of rheumatic disease of the heart, — a gently tonic treatment will be often requisite; and if any preparation of colchicum be exhibited, it should be given with camphor or ammonia, or even with stomachic or gentle tonics.

ii. OF DILATATION OF THE CHAMBERS AND ORIFICES OF THE HEART. — SYN. *Cordis Aneurisma*, Ballonius, Baglivi; *Passive Aneurism of the Heart*, Corvisart; *Cardieurysma*, *Cardiectasis*, Auct.; *Expansion of the Heart's Cavities.*

187. CHARACT. — *Slight palpitations, with dyspnœa and cough; the impulse of the heart being weak and diffused; the sounds being louder, clearer, shorter, and heard over a larger extent of the chest, than natural; and the pulse being weak, small, or irregular.*

188. *A.* DESCRIPTION. — *Dilatation* (*a*) may affect equally *the whole parietes* of one or more of the cavities; or (*b*) it may be so confined to *a portion of the parietes* of a chamber as to form an aneurismal pouch. — *a*. The *first* of these varieties usually presents itself in *three forms*: — 1st. *With thickening of the walls* of the compartments; — 2d. *With a natural state of the walls*; — and, 3d. *With attenuation of the walls.* — The *first* of these has been considered in connection with *hypertrophy*; and most of the remarks made with respect to it, also apply to the *second* of these forms. It is chiefly, therefore, to the *third*, or to *dilatation with attenuation* of the parietes of the chambers, that attention is now directed. — The muscular substance of the heart is often healthy, although dilated; but it more frequently is soft, flaccid, or even remarkably softened — especially when the attenuation, as well as dilatation, is great. Sometimes its structure is readily broken down by the pressure of the finger, and is of a deeper or darker red, or of a paler or more fawn-colour than natural. The more remarkable states of softening observed in connection with dilatation have been consecutive of inflammation of one or other of the surfaces, probably extending, in some degree, to the substance of the heart; and occurring in debilitated, previously diseased, rcachectic constitutions.

189. This lesion of the heart is much rarer than dilatation with thickening, or with a natural state, of the parietes of the cavities; and the instances recorded of it are not numerous. LANCISI, MORGAGNI, CORVISART, BERTIN, KREYSIG, J. FRANK, LAENNEC, LOUIS, and HOPE have described but few cases of it. BURNS and LAENNEC believed that rupture might proceed from dilatation; and Dr. HOPE and Dr. WILLIAMS have met with this occurrence, which is most likely to take place in aged persons. Dilatation with attenuation seldom affects one ventricle without the other; but it is more common, or greater, in the right than in the left ventricle. It more rarely is seated in all the chambers of the organ. The attenuation exists in various degrees. It may be so extreme, that the walls of the ventricles hardly are equal to two lines at the thickest parts (HOPE and CHOMEL). The fleshy columns are usually stretched and spread out. The interventricular septum is proportionately less attenuated than the other parts. The dilatation is more in the transverse than in the longitudinal direction of the ventricles; the heart thereby assuming a spherical form, and the apex being nearly effaced. When both the ventricle and auricle of the same side are much dilated, the intermediate *orifice* is generally also widened, and the valve *insufficient* to close it. As in cases of hypertrophy, the position of the organ is somewhat altered when the dilatation is great, it being more or less transverse, and towards the left. A very slight attention is sufficient to distinguish the distension that takes place, during the last moments of life, from morbid dilatation. The former is slight, presents the appearance of tension, and the muscular substance is healthy; the organ often resuming its natural size when emptied. The latter consists not only of distension, but also of flaccidity, thinning, and softening of the parietes.

190. *b. Partial dilatation of one of the heart's cavities* is but rarely met with. M. BERTIN states, that he has seen one portion of a cavity dilated, and another in its natural state, or even thickened, especially in the right ventricle, near the pulmonary artery. This is evidently a slighter grade of that lesion which has attracted, more recently, considerable attention, under the appellation of "*false consecutive aneurism*" (BRESCHET), "*sacculated aneurism*," and "*true aneurism of the heart*" (OLLIVIER). This alteration has been observed by GALEATI, BUTTNER, CORVISART, BAILLIE, ZANNINI, BERARD, ROSTAN, CRUVEILHIER, BRESCHET, J. JOHNSON, ELLIOTSON, ADAMS, DANCE, REYNAUD, &c. It was found in the heart of TALMA, the celebrated French tragedian. It is exactly similar to the aneurism of large arteries, and has been met with only in the arterial side of the heart; and, excepting in a single case recorded by Dr. ELLIOTSON, where it existed in the left auricle, always in the left ventricle. In many of the cases it was found at the apex; in some at the base, or at the middle of the ventricle; and in others at the front, or side. In this last situation it was detected in TALMA. In the instances which occurred to REYNAUD and ELLIOTSON, two aneurisms were found in the same ventricle. This form of aneurismal tumour varies in *size* from that of a filbert to that of the heart itself. The larger tumours usually contain layers of dense coagula, similar to those which fill the cavities of arterial aneurisms. They communicate with the ventricle by a more or less narrow opening, which, with the whole of their interior surfaces, is generally lined with a membrane continuous with that of the ventricles. Like other aneurisms, they are most common in adult males.

191. *c. Dilatation of the orifices of the heart* is not less frequent than expansion of the cavities; and often coexists with it. The orifices may be dilated in various degrees, as already shown (§ 189.); but generally, when the change is very considerable, the valves become insufficient for their purposes, and the expansion, owing to the regurgitation into the auricles, extends to them. The auriculo-ventricular orifices are most frequently dilated; but in very rare instances, the arterial orifices have experienced this alteration in a slight degree.

192. *B. Causes.*—*a.* Most of the causes, remote and immediate, of hypertrophy, are also those

of dilatation of the *chambers* and *orifices* of the heart. As Dr. HOPE observes, dilatation is merely a mechanical effect of over-distension. Blood accumulated within the cavities, owing to an interruption to its exit from them, will dilate and attenuate their parietes, in proportion to the resistance opposed, and to the force exerted by the muscular structure in order to overcome it. When that force is weak, or insufficient to overcome the resistance, the parietes yield, and the cavities undergo dilatation, with a rapidity depending upon the weakness of the walls and the extent of interruption. It necessarily follows, that the cavity immediately behind the seat of obstruction will be the first to undergo dilatation, and will experience it to the greatest extent. The compartment, also, having the weakest parietes, is, *cæteris paribus*, the most frequently dilated.— Permanent dilatation is the result of prolonged or repeated causes, as contractions of an orifice, disease of the valves, and frequent returns of nervous palpitations. The depressing passions and emotions, as anxiety, fear, &c. (§ 19.), and whatever tends to weaken the power of the heart, may occasion this alteration. The walls of the cavities may also be unusually weak or thin, *congenitally* and *hereditarily*. LANCISI observed this lesion in four successive generations; and ALBERTINI saw a female die of dilatation, five of her brothers having been cut off by the same malady. It is most common in persons of a tall, thin, delicate, feeble, and nervous or lymphatic conformation, and lax fibres.—*Age* has also great influence on its production. It is not uncommon in young children; but it is most frequent in the aged. It rarely occurs in young adults, unless it has been induced by masturbation, or by fevers and diseases of the respiratory organs. In general, all obstructions to the circulation, whether situated in the orifices of the heart, or in the aortic or pulmonary system, will produce it, as well as hypertrophy; the supervention of the former being the result chiefly of debility of the organic nerves supplying the organ, and of impaired tone or deficient nutrition of the muscular structure — of antecedent disease, characterised by debility or cachexia, or by both.

193. *b.* When the *auricles* are protected by a natural state of their valves, and of the auriculo-ventricular orifices, the ventricles may be dilated without the former being materially affected; but when the auricular valves are diseased, so as to occasion interruption to the passage of the blood from the auricles, or when the auriculo-ventricular openings are dilated, so as to permit regurgitation from the ventricles, then the auricles become dilated, although rarely without some increase in the thickness of their parietes.

194. *c. The diseases of which dilatation is most frequently consecutive*, are, inflammations of the heart, and the lesions of the valves and orifices caused by them; rheumatism extending, or translated, to this organ; tubercular consumption; asthma and emphysema of the lungs; secondary syphilis, especially when treated by excessive quantities of mercury (ALBERTINI); adynamic, typhoid, and exanthematous fevers; scurvy, and carcinomatous and hæmato-encephaloid maladies. M. BERTIN contends that dilatation is generally consequent upon some obstacle to the course of the blood; and that the obstacle, at the same time that it gives rise to this lesion of the heart, produces other phenomena, as engorgement of the vessels, serous effusions, passive hæmorrhages; these phenomena, as well as the dilatation, being the result of the same proximate cause. Dr. HOPE justly observes that the change in the capacity of the cavities may result not only from obstacles to the circulation, but also from debility. There can be no doubt of deficient tone of the muscular parietes, and of the softening and asthenia of the organ, shown to follow adynamic fevers, and of protracted nervous palpitations, particularly when connected with chlorosis, anæmia, &c., being sufficient to cause dilatation of one or more of the chambers of the heart, independently of any appreciable obstacle to the circulation. Curvatures of the spine, and whatever diminishes the cavity of the chest, or presses inordinately upon the large vessels, may also occasion this alteration.

195. *d.* The same *causes* and *pathological conditions* which occasion the expansion of a whole compartment or of an orifice, may give rise to the dilatation of a portion of it only, in the form of an aneurismal cavity, especially whatever opposes the transmission of blood from the heart, as laborious occupations, the more violent mental motions as hatred, revenge, jealousy, anger, &c. — This — the only lesion of the heart which ought to be called aneurismal — may be produced independently of inflammatory action, owing to great muscular efforts, or obstacles to the circulation. Where the internal membrane is not destroyed, nor thickened, and where the muscular fibres are stretched, separated, or ruptured, antecedent inflammation may not have existed; but where there is thickening of the internal membrane, or ulceration, or adhesion of the external surface of the dilated part to the pericardium, this lesion may be considered to be a more or less remote consequence of chronic inflammation, affecting a portion of the parietes of the ventricle, the dilated part having lost its elasticity and contractile power. In connection with this, some obstacle to the circulation, or to the passage of blood from the left ventricle, has frequently also been present; the increased lateral pressure arising from impeded circulation dilating or extruding the most softened, weakened, or yielding portion of the ventricle. In the unique case of aneurism of the *left auricle* recorded by Dr. ELLIOTSON, there were extreme cohesion and ossification of the mitral valve, and consequent reduction of the auriculo-ventricular opening, — changes always consequent upon inflammatory action, as above insisted upon (§ 68.). The sinus of the auricle formed a large aneurism, containing dense and thick layers of fibrine; the interior of the tumour being lined with the smooth membrane of the cavities, as in aneurism of the ventricle.

196. C. *The Signs and Symptomatic Effects of Dilatation* have been partly noticed under the head of hypertrophy with dilatation (§ 175.); but those which more especially indicate dilatation with attenuation, remain to be detailed. — *a.* When the affection is considerable, and extends to both ventricles in uniform expansion of the parietes, the heart acquires a rounded shape, and the degree of contraction is lessened; and, as the apex is consequently less forcibly impelled against

the ribs, the impulse is slight, brisk, and low in the præcordia. The first sound of the heart is shorter, louder, and clearer than usual, and is heard over a larger extent than would be expected from the weakness of the impulse. When the dilatation is considerable, the first sound resembles in shortness and flapping character the second, and is to be distinguished from it only by its synchronism with the pulse of the carotids (Laennec, Hope, Williams). When the dilatation is dependent upon disease of the valves and narrowing of the origins of the arterial trunks, the sounds will assume a morbid character accordingly (§ 76.). The pulse in dilatation of the ventricles is necessarily feeble and often small, and various symptomatic lesions are observed, which, however, are referrible rather to the alteration that has produced the dilatation, than to the dilatation itself. In expansion of the left ventricle, the physical signs are most apparent to the left of the sternum, between the fifth and eighth ribs; and the symptomatic phenomena consist chiefly of dyspnœa, oppression in the præcordia, and dropsical effusions in the chest, &c. In expansion of the right ventricle, the physical signs are most evident under the sternum, and are accompanied with a pulsating swelling of the jugulars, especially if the dilatation extend to the auriculo-ventricular opening; the sympathetic changes being principally serous effusions within the cranium, or in the cellular tissue, ascites, œdema of the extremities, short breathing, and various signs of general cachexia.

197. *b.* The *symptoms of partial dilatation* (§ 190.) of the cavities are extremely obscure. Those stated by Dr. Baillie are common to all cardiac diseases. Auscultation renders us little or no assistance in ascertaining its existence. It rarely attains a large size — never so large as to produce an external tumour. The cases recorded by M. Reynaud and Dr. J. Johnson terminated in rupture of the aneurism without any previous suspicion of its existence. Dr. Elliotson's and M. Cruveilhier's cases presented symptoms which merely led to a belief in the existence of organic disease of the heart. In one of the two cases, mentioned in the catalogue of the preparations belonging to the medical department of the army, the patient had complained of cough, dyspnœa, pain in the chest, and hæmoptysis; in the other, the symptoms were not ascertained. Talma died of stricture, amounting nearly to obliteration of the rectum. The aneurism of the left ventricle was small and filled with concentric layers of fibrine. It was remembered that long previously, after having enacted the part of Orestes, in the play of Andromache, Talma felt himself strangely agitated, anxious, and restless for some time; but these symptoms gradually subsided. It was supposed that the internal membrane, or some of the fibres of the muscular structure, had then given way, the consequent effusion of coagulable lymph producing a partial and temporary cure. Others of the cases upon record have been equally obscure: whilst some have been attended by palpitations, urgent dyspnœa, cough, and short breathing; anxiety, pain, and constriction at the præcordia; weak, irregular, or intermittent pulse; inability to lie otherwise than on the back; sudden starting up from sleep, œdema of the extremities, &c.

198. *c.* Dilatation of the *orifices* gives rise to no indications of its existence, unless it is so considerable as to permit a reflux of the current of blood; and even then the signs are equivocal. This reflux is one of the causes of the bellows-sound, and of the purring tremor. When it takes place through the right auriculo-ventricular orifice, it causes a venous pulsation, particularly in the jugulars.

199. *D. Progress, Termination, and Prognosis of Expansion of the Heart.*—The *progress* of dilatation entirely depends upon the nature of the pathological condition, or antecedent disease, of which it is a more or less immediate consequence. A slight degree of expansion, depending chiefly on original conformation, and accompanied with a delicate constitution and thin muscles, may subsist long, or remain stationary for years, without occasioning much disorder beyond dyspnœa, shortness of breath, and palpitations on exertion, or slight asthmatic disorder; but when dilatation is consequent upon a permanent or increasing obstacle to the circulation, or is associated with adhesions of the pericardium, the symptoms are more severe, more rapid in their progress, and attended with evidence of general cachexia. When dyspnœa becomes urgent, or œdema or dropsical effusions take place, or when pulsation of the jugulars is observed, the disease is generally rapid in its progress, especially if exasperated by exertion, mental disquiet, or attacks of fever, &c.; although judicious treatment, by repeatedly procuring the removal of effusions, will often prolong life a considerable time. Much, however, will depend upon the age, strength, constitution, and previous state of the patient. Upon the above considerations the prognosis must entirely depend.

200. *E.* Treatment *of Dilatations of the Cavities and Orifices, with Attenuation of their Parietes.* — The *first object* is to ascertain the exciting or pathological cause of the dilatation, and to remove it as much as possible. When the cause consists of disease of the valves or orifices impeding the circulation, it is difficult, if not impossible, to effect this object, yet it ought not to be left unattempted; but when the cause is of a less permanent kind, as peripneumony, spinal curvatures, pertussis, asthma, bronchitis, hydro-thorax, emphysema of the lungs, &c.; or when the dilatation has been produced by laborious occupations, constrained postures, strait lacing, playing on wind instruments, &c.; this intention ought never to be overlooked; for, if the expansion have not proceeded so far as to deprive the muscular structure of the organ of its resiliency, a more or less complete restoration of the dilated cavity may be effected. Even when it is impossible to restore the organ to its healthy state, an increase of the dilatation may be prevented, and the patient's life may be prolonged to the usual limits.

201. The greatest attention should be paid to *diet* and *regimen*, as well as to the selection of *medicinal agents;* and both classes of means ought to be directed to the support of vital power. With this view, vegetable and mineral tonics may be prescribed, with aromatics, antispasmodics, and anodynes, according to circumstances. Small doses of quinine may be given with camphor and hyoscyamus, or of the sulphate of iron or of the sulphate of zinc, with the extract of hop. Valerian, assafœtida, the compound galbanum pill, or the compound iron pill, may also be exhibited in

similar forms of combination; or either of the alkaline solutions in use may be given with chalybeates, or with tonic infusions or decoctions. Where there is any obstacle to the circulation, referrible either to a morbid state of the lungs, or to diseased valves, the fixed alkalies, or the subborate of soda, with tonics, will be found of much service. If there exist pulmonary congestion, with copious and difficult expectoration, the decoction of *senega root*, with an aromatic water, and small doses of camphor, will be productive of benefit. If attacks of dyspnœa or of asthma take place, and if the dilatation be complicated with emphysema or with œdema of the lungs, this combination will be of use; or camphor, ammonia, assafœtida, ammoniacum, the æthers, &c. may be exhibited in forms, which the peculiarities of the case will indicate. At the same time, the surface of the body should be kept warm, and derivatives applied to the extremities, fresh air being freely admitted into the patient's apartment.

202. The utmost attention ought always to be paid to the state of the digestive organs. The secretions and excretions should be promoted; those of the liver and bowels being freely evacuated by an occasional dose of the blue pill at night, and of a stomachic aperient the following morning. Flatulent distension of the stomach and bowels, and acidity, should be especially guarded against, and removed by the means suggested in the article Flatulency (§ 15. *et seq.*); for these states of disorder remarkably aggravate both functional and organic affections of the heart, as shown in the article just referred to (§ 8.). — The circulation ought to be kept tranquil by moral and physical quietude, and by a light, nutritious, but not heating, diet. In order to preserve a free state of the cutaneous function, and to prevent catarrhal affections, flannel should be worn next the skin, and the feet kept warm by woollen stockings. Febrile and inflammatory affections, and particularly inflammations of the lungs and bronchi, as Dr. Hope very properly advises, should be sedulously guarded against, by adopting these and other means, and promptly treated when they occur. — But even in these circumstances, I would add, bloodletting ought to be resorted to with extreme caution, and rarely or never by venæsection. In all cases of expansion of the cavities of the heart, the organ is unable to accommodate itself to large or sudden losses of blood, and hence a fatal collapse may be the result of the abstraction of this fluid. If the contingent pulmonary congestion should render vascular depletion an appropriate remedy, a small quantity only ought to be taken away, and always when the patient is in the recumbent posture, restoratives and external derivatives being also resorted to.

203. If the expansion has followed low or adynamic fevers, or has been caused by venereal excesses or masturbation, or by non-inflammatory softening or relaxation of the muscular structure of the organ, as in cachectic, chlorotic, or scorbutic constitutions, *tonics* are especially requisite; particularly the preparations of iron, the tincture of the muriate of iron, and chalybeate mineral springs; residence in a pure and dry air, and light nourishing food. The vegetable tonics with the alkaline subcarbonates, or preferably with the vegetable or mineral acids, especially the muriatic, the nitro-muriatic, and the acetic, will also be of service, according to the state of antecedent and concomitant constitutional disease.

204. When *disease of the valves and orifices* of the heart, or any other obstacle to the circulation, of which dilatation is a consequence, has proceeded so far as to have also occasioned dropsical effusions, treatment is seldom productive of more than temporary benefit. The means which promise the greatest advantage, especially when effusion has taken place, are so fully stated in the article Dropsy (§ 45—47.), that I need not particularise them at this place. — If permanent dyspnœa, emphysema of the lungs, increased exudation into the bronchial tubes, and difficult expectoration, be associated with this state of cardiac disease, *expectorants*, especially the decoction of senega, the balsams, camphor, ammoniacum, &c., with opium, will be of service.

205. In addition to strict attention to *diet* and *regimen*,—the former consisting chiefly of light animal food, in moderate quantity, and the more farinaceous vegetable substances; the latter of mental and bodily quietude,—the patient should reside in a dry, bracing, temperate, and equable climate, and in large well-ventilated apartments. He should observe early hours, and, as his health improves, take very gentle exercise in the open air. The cold or salt water bath, or the shower-bath, will also be of service, if directed with caution and discrimination.—In this, as well as in all other affections of the heart, bulky, flatulent, and acescent vegetables should be avoided; and that kind of food preferred which is found to be most easy of digestion. Recourse may be had to chalybeate or other strengthening mineral waters, as convalescence advances. Admitting it possible that *partial dilatation or aneurism of the cavities*, and that *dilatation of the orifices* of the heart, may be detected during life, — a circumstance not likely to occur in respect of the former lesion especially, — the treatment will not vary from that which has been now recommended.

iii. Atrophy of the Heart — *Cardiac Consumption.*

206. Charact. — *Diminished size or wasting of the heart, the actions of the organ being feeble, limited in extent, and attended by a weak and confined impulse, and by little or no dulness on percussion in the præcordia.*

207. *A.* The heart may be unusually small, *from original conformation*, or *from disease*. — *a.* Many of the instances of extreme smallness of this organ on record are referrible to the former cause. Those adduced by Morgagni (*Ep.* lxx. 5.), Lieutaud (vol. ii. obs. 453.), Burns (*Op. cit.* p. 110.), Kreysig (b. ii. p. 468.), Otto (*Compend. of Comp. Anat.* p. 264.), and others, are of this kind. The majority of those referred to by Lieutaud and Ploucquet (*Med. Digest.* art. *Cor — parvum*) are stated so loosely by their respective authors, as to be almost devoid of interest. Otto thinks that a disproportionate size of the heart to the whole body is sometimes hereditary; and that, when it is congenital, it is often connected with other vicious formations of the organ, or with general weakness and imperfect developement. If a really small heart be fleshy, firm, and red, and its compartments in due proportion to one another, it may be considered as a vice of conformation.

208. *b. True atrophy*, or diminution of the

heart from disease, is rarely observed in a remarkable degree. Slight grades of it are, however, not uncommon, especially in wasting diseases, as phthisis, mesenteric obstructions, and chorea, although the atrophy of this organ is not so considerable, nor so rapid, as in other muscles. Otto attributes this to the want of cellular tissue between the muscular fasciculi.—Portal, Testa, and Kreysig suggest, that the seeming diminution, caused by the violent contraction of the organ, at the time of death, should not be confounded with atrophy of it. True atrophy is accompanied with attenuation, softness, or paleness, or hardening of the structure, or with a shrivelled or wrinkled appearance of the surface of the viscus. It may be so considerable as to reduce the organ to one half or one third its natural weight. M. Chomel found the heart not larger than a hen's egg in a man who died in the hospital *La Charité*. As respects its form — 1st. One or more of the compartments are attenuated without any change in their capacities, the heart being but slightly diminished in bulk; — 2d. With attenuation there is much more rarely diminution of the capacities of the chambers, the organ being very much lessened in size; — and, 3d. With diminution of the cavities, the parietes may be of the natural thickness, or even above it: this is the most frequent form of atrophy.

209. *B.* The *Causes* of atrophy of the heart are — 1st. *Local*; — 2d. *Moral*; — and, 3d. *Constitutional.* — *a.* Of the *first*, the most common are compression arising from the pressure of matters effused into the pericardium, or from tumours developed in the mediastinum, and constriction or other changes of the coronary arteries, especially ossific deposits in their coats, &c. I doubt, however, the influence of compression from these causes, as the heart is very rarely found atrophied where the greatest amount of effusion has existed in the pericardium. In the case referred to below, where there obviously is extreme atrophy from local causes, the previous effusion never seemed to have been very great.* — *b.* The *moral causes* consist of mental anxiety, and all the depressing passions, particularly when their action has been prolonged. — *c.* The *general causes* are whatever arrests the nutrition of muscular structures; and yet the heart seldom participates in the change of these parts, or only in a slight degree. In the diseases just mentioned (§ 208.), more or less atrophy is sometimes met with; but it seldom bears any relation to the wasting of the voluntary muscles. In a case of tubercular consumption, in which death occurred instantaneously, before ulceration had commenced, and before emaciation had become considerable, the heart was small and flabby, and the parietes of the ventricles somewhat attenuated. The most marked cases of atrophy which I have seen were in persons who had died after attacks of chorea and chlorosis, and after hypochondriasis and distress of mind.

210. *C.* The *Symptoms* are seldom such as to indicate, with tolerable certainty, the existence of atrophy of the heart, unless it be very considerable. In this case, the impulse is weak, limited, or small; the sounds are indistinct, or faint, in proportion as the cavities are diminished in capacity; and there is little or no dulness on percussion. The pulse is small, thready, and often frequent; and there is commonly marasmus, and loss of colour. Yet emaciation can hardly be reckoned as a sign of atrophy, as it not infrequently accompanies hypertrophy of this organ.

211. *D.* The *Treatment* of this lesion should be directed — 1st, to the removal of the causes, as far as it can be accomplished; and, 2dly, to the restoration of the healthy nutrition of the organ. The latter of these intentions will be best accomplished by attention to the digestive and assimilative functions, and by the use of chalybeate medicines and mineral waters, with suitable exercise in a dry and temperate air; and the other means recommended for *functional disorders* (§ 50—53.), for *softening* (§ 221.), and for *dilatation* (§ 200.) of the heart.

212. iv. Contractions of the Cavities and Orifices of the Heart. — *A.* Diminution of one or more of the *cavities* arises — 1st. From *concentric hypertrophy* of the parietes (§ 158.); — 2d. From *atrophy* of the heart (§ 208.); — 3d. From the pressure of tumours, or of effused fluids, on one or more of the compartments of the organ; — and, 4th. From concretions of lymph or of fibrine, recent or organised. — The *first, second,* and *third* of these morbid states have received attention at the places referred to; the *fourth* will be fully considered hereafter. From whatever of these causes the diminished capacity of the cavities arises, it is evident that very serious phenomena will result as soon as this lesion becomes so great as to materially derange the circulation, especially venous congestions, and serous effusions and infiltrations. When the cavity of the left ventricle is diminished, the pulse is small, as in narrowing of the aortic orifice.

213. *B.* *Contraction of the orifices* of the heart may proceed from the same changes as produce diminution of the cavities; but it most frequently is a more or less immediate result of internal carditis, and attendant upon induration of the valves. As such it has already been considered, when treating of the chronic states of endocarditis (§ 66, 67.).

214. *C.* The *Treatment* of diminished capacity

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* The following case is singular: — A girl, at the age of seven years, was attacked with rheumatism of the joints of the upper extremities, with extension of the disease to the pericardium, — the former affection subsiding partially as pericarditis was developed. The treatment, mentioned in the *note* to par. 153., was prescribed, and the disease nearly disappeared. But the pericarditis returned on two subsequent occasions at considerable and irregular intervals; and, in the second and third attacks, the cartilages of the left ribs were pushed outwards by the effusion into the pericardium. A mercurial treatment was prolonged; recovery seemed more complete, and the case was dismissed. About eight or nine months afterwards, this child was brought to me with the lower half of the sternum, and the cartilages of the left ribs, which were formerly protuberant, drawing backwards towards the spine, so as to form a deep and large depression in this situation, and scarcely to leave sufficient space for an atrophied heart to lie between the spine and the depression. The epigastrium was drawn inwards, and upwards, on each contraction of the ventricles. In this case, which was seen also by some of my colleagues at the Middlesex Hospital, the repeated attacks of pericarditis had given rise to adhesions of the pericardium to the heart, and probably also to the pleura; to this atrophy had succeeded; and the sternum had been drawn inwards with the wasted heart. This child was, even in this state, much recovered. She could take gentle exercise. The heart did not present any morbid sound, at this period; but there was well-marked epigastric pulsation, of a confused kind, probably owing to the pressure of the heart on the aorta. She was alive and able to be about when this was written.

of the *cavities* is rarely followed by any benefit. The changes producing it manifestly are beyond our resources. This remark is nearly applicable to contraction of the *orifices*. The means, however, which may be employed, should depend upon the cardiac lesions, and the symptomatic changes consequent upon this alteration of the orifices and valves. If *hypertrophy* have become associated with it, the treatment advised in the chapter on this lesion (§ 182.), according to the form it may assume, will be appropriate. If *expansion* of the cavities have taken place, the means prescribed under that head will be requisite (§ 200.).

215. v. OF ALTERATIONS OF THE COLOUR AND CONSISTENCE OF THE HEART. — *A.* The *colour* of the heart may vary, or be irregular, both on its surfaces and in its substance. One or more *white* specks, or patches, of different sizes, are often found. They are produced by a slight inflammation, causing thickening and opacity of the membrane, and are seated in either the internal or external surfaces. The structure and external surface of the organ are often *paler* than natural in cachectic, dropsical, and leucophlegmatic habits; and are sometimes of a *pale yellow* in these habits of body, and in hearts which are preternaturally fat. In inflammation, and in hypertrophy, this organ is *redder* than usual. In softening, suppuration, mortification, and other organic lesions, it is often spotted, of a *greyish, light*, or *dark brown*. Sometimes the internal surface, in one or all the cavities, is *reddened* throughout by the imbibition of the colouring matter of the blood; and a similar discolouration of the external surface has been observed to follow from the transudation of blood, and from hæmorrhage into the pericardium. OTTO found the heart tinged with green in a case of poisoning with stramonium seeds.

216. *B. Alterations of consistence* have already been partially noticed (§ 113—115.); but chiefly as consequences of inflammation. — *a. Softening* of the heart is not infrequently found in persons who have died of low fevers and malignant diseases, and it then occurs in the advanced stages of these maladies; but it is also met with under other circumstances. It presents two forms — one the result of inflammation (§ 113.), generally with asthenic characters; the other seemingly in no ways arising from inflammatory action, but rather from impaired organic nervous or vital power, and insufficient nutrition of the organ.—In the former, the softening is most commonly attended by a deeper tinge of colour, or discolouration; and the substance of the heart is not wasted, or is even more bulky than natural; signs of antecedent inflammation being usually present either in the internal or in the external surface, or even in the substance of the organ itself. In the latter form the heart is paler, as well as softer, than usual, — is easily broken down, — and frequently the cavities are somewhat dilated; but there is rarely any other distinct vice of structure. In a few extreme cases, the muscular fibres present a sort of fish-like structure, especially in young chlorotic and leucophlegmatic persons.

217. The non-inflammatory form of softening is met with chiefly under the circumstances just mentioned, and in fatal cases of scurvy, purpura, chorea, dropsy, and anæmia. In all these I have seen it, as well as in mesenteric decline, and tubercular consumption. It is occasionally associated with an inordinate deposition of fat around the organ; this latter being generally attended by a relaxed, pale, softened, or atrophied state of the muscular structure of the heart. In persons who have died suddenly, and without any distinct cause, the heart is sometimes soft, flabby, and even bloodless. Cases of this kind are recorded by Mr. CHAVALIER, and by my friend Mr. WORTHINGTON (*Lond. Med. Reposit.* vol. xvii. p. 361.). An instance also recently occurred in my own practice. In the softened state of the heart found in low fevers and in other contaminating diseases, there is also observed more or less dark discolouration of it. Violent exertion diminishes the vital cohesion of this organ, as well as of other muscles, deepens its colour, and causes it to be easily broken down. SENAC and OTTO found it very soft in hunted deer. This alteration is probably increased by the effect which an inordinate acceleration of the circulation produces upon the fibrine of the blood, as shown by HALLER and others. (See art. BLOOD, § 134.)

218. *b.* The *Symptoms of softening* entirely depend upon the proximate cause. If it arise from inflammation, then it is generally attended by the signs and symptoms of an associated *endocarditis* or *pericarditis*. If it be accompanied with *dilatation*, more or less of the phenomena attendant upon that lesion may be expected. In its simple or non-inflammatory states, there are generally great languor and debility; a soft, quick, weak, feeble, and small pulse; frequent faintings; a sallow, pale, faded, or tallowy complexion; passive œdema of the extremities, and sometimes of the countenance; the sounds of the organ being dull and obscure, and the impulse weak or nearly gone. As this lesion is often attended by effusion into the pericardium, the sounds and impulse will be further obscured by this circumstance; and the sphere of dulness on percussion extended accordingly. When it is not thus associated, the faint sounds and impulse of the heart will not be attended by greater dulness on percussion than natural. (See also the sections on *Inflammations* (§ 121.) and on *Dilatation* (§ 196.).

219. *c. Induration of the heart* is generally a remote consequence of inflammatory action (§ 119.), and is more rarely observed than the opposite lesion. It is often simulated by an unusual contraction at the moment of dissolution. In hypertrophy, also, the heart is firmer than natural, but not to amount to a morbid induration, so as to afford great resistance to the scalpel, or to cause a crepitation on dividing it. — Induration may occupy the whole of a ventricle, or only part of it; and it may accompany other lesions, or alterations of the organ as to size. It is evidently the consequence of altered nutrition, and is different from the firmness observed in hypertrophy, as well as from the cartilaginous and osseous hardening of portions of the organ sometimes consequent upon inflammatory action (§ 120.).

220. *d.* Of the *Signs* and *Symptoms* of this lesion, nothing positive is known. LAENNEC supposed that, in its slighter grades, the impulse of the heart was increased; and CORVISART thought that, beyond a certain point, it rendered the

contractions of the ventricles more difficult, and their movements more confined.

221. *e.* The *Treatment* of alterations of the consistence of the heart should be directed according to the evidence of these changes that may exist, and to the associated cardiac and symptomatic changes. In *softening*, we must depend chiefly upon the exhibition of tonics, especially quinine, cinchona, mineral acids, &c., or upon the tincture of the muriate, or the sulphate, or the other preparations of iron, pure air, and the means recommended for dilatation (§ 200.). If it were possible to ascertain the presence of *induration* of the heart, but little could be hoped from medical means. Those advised for hypertrophy (§ 182.) are, perhaps, the most appropriate.

222. vi. Of Serous and Sanguineous Infiltrations of the Heart. — *A. Infiltration of Serum into the Cellular Tissue of the Organ* — *Œdema of the Heart,* Bouillaud — is very rarely seen. This writer, however, describes it as follows: — The cellulo-adipose tissue enveloping the viscus presents the form of a tremulous, gelatiniform mass; from which exudes, upon pressure, a liquid, transparent serum, which is sometimes colourless, and occasionally of a yellowish green tint. The cellular tissue which is thus infiltrated is of a dull white, or opaline hue, as if macerated by the contained fluid. — This alteration may accompany other dropsical maladies, or cachectic states of the system; but it is referred, by M. Bouillaud, chiefly to a varicose state of the coronary veins, consequent on the difficult passage of the blood from them into the right auricle. Obliteration of some of the cardiac veins will occasion this lesion; but it has hitherto not been described.

223. *B.* The *Exudation* or *Infiltration of Blood* into the cellular tissue of the heart — *Cardiac Hæmorrhage* — has been also met with, but very rarely, and chiefly in the form of *petechiæ*, or small *ecchymoses.* One or two instances of a more copious hæmorrhage into the substance of the organ, so as to form a distinct hæmorrhagic cavity — *Apoplexy of the Heart* — have been recorded. — *Petechiæ* and *ecchymoses,* principally on either of the surfaces of the organ, have been noticed by Stoll, Fairbairn, and Otto. I met with this alteration in a case of purpura hæmorrhagica, and in another of scurvy. In these diseases, and in the putro-adynamic states of fever, I believe that it is not very uncommon. Otto (*Comp. of Path. Anat.* § 177. p. 278.) states, that he met with effusions of blood, in various parts of the heart, in a case of petechial fever; also in a person killed by fire-damp, and in a child who died of hooping-cough. In a case of violent inflammation of the heart, he found small extravasations of blood under the outer membrane. Dr. Fairbairn (*Trans. of Med. and Chirurg. Soc. of Edin.* vol. ii. p. 157.) observed effusions of blood under the inner membrane of the heart in a case of purpura; and Cruveilhier (*Anat. Path.* livr. xxii. pl. 3.), saw the same lesion in the substance of the left ventricle. The exudation and effusion of blood into the pericardium has received attention in the article Hæmorrhage (§ 276.).

224. vii. Of Fatty Degenerations and Obesity of the Heart. — The *fatty degeneration of the structure* of the organ is not to be confounded with an *excessive deposition of fat* between the pericardiac covering and the substance of the heart, frequently met with in corpulent persons. — *a. Excess of fat in this viscus* is often accompanied with a flabby, softened, and attenuated state of the parietes. In these cases, the adipose substance often penetrates to some depth between the muscular fibres. — The symptoms attending this state of the organ cannot be referred so much to the accumulation of fat — to *the obesity of the organ* — as to the change in the muscular parietes attending it; both alterations being results of weakened organic nervous energy, and of, consequently, impaired assimilation.

225. *b. The true greasy degeneration* is a transformation of the muscular substance of the organ into a fatty matter similar to that first described by Haller and Vicq d'Azyr as occurring in the muscles. This lesion is generally confined to a portion of the parietes. Laennec and Andral met with it only at the apex. Dr. Hope found the greater part of both ventricles thus degenerated, the colour being that of withered leaves. More rarely, the substance of the heart has the appearance of lard, as remarked by Corvisart, Burns, Duncan, Cheyne, Luchett, and Chomel; the less altered portions in these cases are not only soft and flabby, but they also have an oily aspect.

226. *c.* Both these forms of fatty degeneration sometimes nearly approximate. M. Andral remarks that, most frequently, the muscular fibres are not really converted into fat, but are only atrophied by the excessive deposition of fat between them; yet, in some cases, they seem to have undergone this change, as they grease both paper and the scalpel, owing to an oily matter infiltrating them. That the atrophy of the muscular substance is not a mere consequence of the accumulation of fat, as Andral and others suppose, and that both changes are joint consequences of impaired vital power and imperfect assimilation, are satisfactorily shown by the circumstances under which they occur — by their being met with only where these primary pathological conditions exist, especially in aged persons, and by their having been found in connection with an excessive quantity of oil in the blood; the increase of this fluid in the circulation being a manifest result of impaired assimilation. Mr. Smith (*Dub. Journ. of Med. Science,* vol. ix. p. 412.) has detailed two cases in which this connection was observed; and one recently fell under my own observation. In Mr. Smith's cases, globules of limpid oil floated on the surface of the blood; in my case, the serum was remarkably milky, from the quantity of fat it contained. — From the history, and the alterations found on dissection, of two cases detailed by Dr. Duncan (*Edin. Med. and Surg. Journ.* vol. xii. p. 65.) and by Dr. Simeons (*Heidl. Kinisch. Ann.* t. iii.), it appears that inflammation of the heart may terminate in the true fatty degeneration of the muscular substance of the organ.*

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* It may be interesting to subjoin the particulars of a few of the cases of this lesion which have been put upon record.

1. A young married woman was seized, ten days before coming under Dr. Duncan's care, with rigors, followed by great anguish and pain under the sternum, with jactitation, want of sleep, rheumatism of the joints, pleuritic pains in the chest, cough, expectoration, dyspnœa, in-

227. *d.* Of the *Signs of Obesity and Fatty Degeneration of the Heart* little can be stated with confidence. Many writers suppose that the accumulation of fat, together with the softening of the muscular substance, embarrasses the organ, and ultimately arrests its action. Boerhaave thus accounted for the sudden death of a person whose heart was found loaded with fat. Portal (*Anat. Med.* t. iii. p. 75.) believed that obesity of the heart produces palpitations, dyspnœa, asthmatic affections, and even sudden dissolution; and Bonet, Senac, and Fothergill entertained similar opinions. — It has been also supposed that the softening and attenuation of the muscular substance attending the excessive deposition of fat in this organ, dispose to *perforation* or *rupture* of it. Morgagni and Bouillaud have recorded cases which favour this view. In one of the two interesting instances adduced by Mr. Smith, the sudden death was owing to rupture of the left ventricle. Kreysig remarks that, more commonly, obesity of the heart gives rise to no symptoms by which its existence can be inferred during life. M. Chomel, however, thinks that it often occasions dyspnœa and palpitations, and very probably faintings, or sinking; an irregular, weak, soft, small, and slow pulse; and anasarca, or œdema of the extremities, may also be produced by it.

228. *e.* An excessive deposition of fat under the pericardium, according to M. Bizot, is much more frequent in *females* than in *males*. He found, in 35 of the latter, the heart very much loaded with fat in 4; but, in 42 of the former, it was equally charged in 23 cases. That the accumulation of fat around the heart is not necessarily connected with, nor dependent upon, general obesity, is shown by the circumstance of 29 of the female cases having been thin or emaciated, and yet of these there were 14 instances of obesity of the heart. Of 13 females of a full habit, 9 presented an accumulation of fat around this organ. In 25 *phthisical females*, M. Bizot found a maximum deposition of fat in this situation in 11 cases, a medium quantity in 11, and complete absence of it in 3. In 11 phthisical men, this deposit was wanting in 6, and very scanty in 5. (*Mém. de la Soc. Méd. d'Observat.* t. i. p. 351.) I have observed an unusual accumulation of fat around the heart most frequently in habitual drunkards.

229. *f.* A *morbid deposition of fat* has likewise been observed on *the external surface*, and between *the layers of the pericardium*; sometimes to the extent of producing an injurious pressure upon the heart and great vessels; and even sudden death. Instances of this change have been noticed by Bonet, Senac, Godart, Morgagni, Meckel, Testa, Parry, Black, Kreysig, and Horn. That this deposition is entirely independent of general obesity, is confirmed by the remark of Otto, who states, that he has met with it although there was meagreness of other parts of the body. Fatty deposits on the pericardium have been incorrectly considered as causes of angina pectoris, by Fothergill, Wall, and Schramm; they are only contingently associated with it, or with neuralgia of the heart, in rare instances.

230. *g.* The *Treatment* of this lesion, in cases where the above indications, conjoined with a leucophlegmatic and corpulent state of the frame, render its existence probable, consists in whatever will improve the digestive and assimilative functions and the organic nervous energy. Tonics, chalybeate preparations; iodine, or iodine with iron; stomachic aperients; regular exercise in a dry open air; and abstinence from fat, oily, or rich articles of diet, and from stimulating beverages, especially spirituous and fermented liquors; constitute the chief means of cure — if, indeed, a cure be practicable.

231. viii. Of Adventitious Formations in the Heart and Pericardium. — *A. Of Earthy and Ossific Depositions*, little remains to be added to what has been already advanced, when considering them as occasional terminations of chronic inflammation (§ 119, 120.). But calcareous phosphates are sometimes deposited in circumstances which are by no means conclusive of the presence of inflammatory action, particularly in

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ability to lie down, followed by œdema of the extremities, the pulse having become weak, soft, and small. The treatment was antiphlogistic for some time after her admission into the hospital (on the eleventh day of the disease), and subsequently palliative. — She died six weeks after the attack. — On *dissection*, the pericardium was found universally inflamed, and firmly adherent to the heart. The lungs were agglutinated to the pericardium, and to the costal pleura. The heart was enlarged, and thickly covered with coagulated lymph, by which the pericardium adhered to it. Under this lymph, about two thirds of the structure of the heart was changed into condensed fat, which melted, stained paper, and swam in water: the remaining third had almost lost its muscular appearance. — The columnæ carneæ, in both the ventricles, were larger than natural. Ossific deposits were found in the aortic and mitral valves.

2. A gentleman, aged sixty, who had experienced attacks of gout, and had lived fully, was struck with apoplexy; for which he was treated, by Dr. Cheyne, in the usual manner. His pulse, however, continued extremely unequal and irregular; dropsy supervened; and he died, some weeks afterwards, of a recurrence of the apoplectic seizure with hemiplegia. — On *dissection*, the heart was found greatly hypertrophied. The lower part of the right ventricle was converted into a soft fatty substance; the upper part was remarkably thin, and gradually degenerated into this substance. The whole substance of the left ventricle, with the exception of the internal reticulated structure and columnæ carneæ, was converted into fat, the cavity being greatly enlarged. The valves were sound. The aorta was studded with steatomatous and earthy concretions. The principal peculiarity in the symptoms was the state of the respiration, which was irregular, and often suspended for a quarter of a minute. (*Dublin Hosp. Reports*, vol. ii. p. 216.)

3. Mr. Adams (*Ibid.* vol. iv. p. 396.) has detailed the case of a man, aged sixty-eight, of a full habit of body, who was subject to cough, and frequent attacks of an apoplectic nature. His breathing was irregular, and his pulse about thirty in a minute. He died from an apoplectic attack. — On *dissection*, the right auricle was much dilated. The right ventricle seemed composed of fat, of a deep yellow colour through most of its substance. The reticulated lining of the ventricle, which, here and there, allowed the fat to appear between its fibres, alone presented any appearance of muscular structure. The left ventricle was very thin, and its whole surface was covered with a layer of fat. Beneath this the muscular structure was not a line in thickness, and was soft, easily torn, and like liver. The septum of the ventricles presented the same appearance. In both ventricles, even in the lining fibres, yellow spots were seen, where fat had occupied the place of muscular structure. The whole organ was very light. The valves of the aorta were partially ossified.

4. A girl, during arthritic rheumatism, complained of various symptoms, many of which were referrible to the heart. Internal heat, with coldness of the surface, suppressed menstruation, cold perspirations, very feeble action of the heart, were complained of. Death took place after ten months. — On *dissection*, the lungs were found adherent to the pericardium and costal pleura. Yellowish white filamentous adhesions existed between the heart and pericardium. Two thirds of the muscular substance of the organ was converted into a greyish yellow mass of fat. (Dr. Simeon's *Op. cit.* Heidl. 1827.) — See, also, Dr. Elliotson *On Diseases of the Heart* (p. 32.), and the two cases recorded by Mr. Smith, in which free oil was seen in the blood; and in one of which, also, softening and rupture of the left ventricle were observed.

aged persons, and when other consequences of this action are not observed. — *a*. In many cases, a whitish patch appears, either in the fine cellular tissue uniting the enveloping membrane to the heart, or between the reflections of the internal membrane composing the valves, increases in thickness, and assumes more and more the characters of cartilage, especially in the latter situation. The morbid secretion giving rise to this patch ultimately becomes the seat of osseous or earthy deposits. M. ANDRAL divides the ossiform formations found in the heart into *three species*, as they are seated in the cellular, fibrous, or muscular tissue. — (*a*) That in the *cellular tissue* is the most common, the portion of it uniting the reflections of the internal membrane to the fibrous structure of the orifices and valves being most frequently thus altered. The calcareous phosphates are deposited in the cellular tissue, in minute grains, or in considerable masses, separating and compressing the surrounding textures. They are more rarely met with in the tissue connecting the muscular fibres; and they there form either isolated masses, or are connected with the deposits formed around the orifices. — (*b*) The *fibrous tissue* frequently also becomes the seat of the osseous deposit, and chiefly in three points: — 1st. In the tendinous zone encircling the left auriculo-ventricular orifice; — 2d. In the fibrous structure of the valves; — and, 3d. In the tendons of the mitral valve. — (*c*) The third species is the most rare. Indeed, it is doubtful whether the *muscular fibre* ever becomes the seat of this alteration. It seems more probable that the deposits, in the connecting cellular tissue, by their bulk, compress or partially destroy the muscular structure, than that this structure is converted into bone. The rare instances on record, especially those adduced by BURNS, RENAULDIN, and others above referred to (§ 119.), are most probably merely proofs of the partial destruction of the muscular tissue in the seats of the excessive osseous or calcareous formations.

232. *b*. The *pericardium* very rarely presents patches of the cartilaginous and osseous transformations. Instances, however, of the former have been recorded by BOERHAAVE, RIOLAN, HAUTESIERK, MORGAGNI, SAVIARD, OTTO, and TESTA; and of the latter have been observed by AURIVILLIUS, SAVIARD, WALTER, HALLER, PASTA, SENAC, PROST, RAYER, LAENNEC, and ABERCROMBIE, in the fibrous or in the serous layer. — Fibro-cartilaginous and osseous concretions are still more rarely found loose in the cavity of the pericardium. They have been detected only by LANZONI and OTTO; and have probably had their origin in peduncular tumours, which had subsequently been broken off.

233. *c. Signs.* — LAENNEC supposed that cartilaginous or osseous formations in the substance of the heart may be recognised, when very considerable, by an augmentation and modification of the sound. That a morbid sound will be heard when the orifices and valves are implicated, cannot be disputed; but the phenomena consequent upon these changes, when confined to the body of the organ, have not been observed with any precision. In a case noticed by M. ANDRAL, the suppositions of LAENNEC were not confirmed. It is unnecessary to add that these lesions are altogether beyond the reach of *treatment*.

234. *B. Tubercular Formations* have been very rarely found in the muscular structure of the heart. M. LAENNEC met with only three or four cases; but OTTO and BOUILLAUD never saw one. M. ANDRAL remarks, that the heart is one of the organs in which tuberculous deposits are most rarely observed. Instances, however, are recorded by HILDANUS, BONET, MORGAGNI, PORTAL, AUTENRIETH, SPENS, LAWRENCE, BAYLE, MACMICHAEL, and ELLIOTSON, at the places referred to below. In a man, aged 34, who complained of pain in the chest, cough, inability to remain in the recumbent posture, and subsequently of irregularity of pulse and palpitations, hypertrophy of the left ventricle, and tubercular formations in the muscular structure, were found after death. (*Cat. of Prepar. in Museum Fort Pitt, &c.* p. 38.) In an aged man, who died of pulmonary consumption (*Dub. Med. Journ.* 1833), a tubercular mass was found in the parietes of the left auricle obstructing the trunks of the pulmonary veins. M. SAUZIER detected, in a man who died of tubercular disease of the lungs, pancreas, &c., tubercles in a crude state in the walls of the auricle, the pericardium being adherent in the situation where they existed. Most of the cases of this lesion on record have occurred in persons who were labouring under extensive tubercular disease of the lungs and other organs: many of them have not been observed with any degree of precision; and the anatomical descriptions have generally been very loosely given. — Tuberculous productions have been found also in the internal surface of the *pericardium*, by MUSGRAVE, HALLER, VOIGHTEL, BAILLIE, OTTO, and others.

235. *C. Watery Cysts* and *Hydatids* have been detected both in the substance, and on either of the surfaces, of the heart. — *a*. Simple *cysts* have not infrequently been confounded with hydatids; the former having been described as instances of the latter formation, especially some of those mentioned by BONET, RUTTY, MORGAGNI, HUERMANN, SALZMANN, CLOSSIUS, and others. PORTAL found several hydatids on the base of the heart; MECKEL and BERNHARDI, large hydatid sacs on the left ventricle; PRICE, a large single hydatid in the muscular substance, in a boy who died suddenly; ABERCROMBIE, a bag containing two ounces of albuminous fluid on the left auricle; and TROTTER, two hydatids within the right ventricle. It is, however, doubtful whether these were really cases of hydatids. From the imperfect account given of the most even of these, it may be inferred, that some of them, at least, were merely instances of serous cysts. — M. ANDRAL remarks, that these cysts vary from the size of a pea to that of a large hen's egg. They are most frequently found between the external surface of the heart and pericardium; but they are sometimes seen on the internal surface of one of the chambers. In other cases, they are not visible on either surface, and it is only on dividing the muscular structure that they are detected. M. DUPUYTREN saw a number of these cysts imbedded in the walls of the right auricle, and protruding a considerable way into its cavity. M. ANDRAL found a cyst, as large as a walnut, in the walls of the left ventricle, which were slightly hypertrophied. In another case, he detected one on the free surface of the lining membrane of the right ventricle, attached to it by a delicate pedicle

of the same texture as this membrane. Dr. **Elliotson** mentions a case in which a number of globular cysts, containing a bloody fluid, were attached by pedicles to the fleshy columns.

236. *b.* Instead of simple cysts, true hydatids have been found in the heart, but in extremely rare instances in the human subject; they are more frequently met with, in this organ, in the lower animals. M. **Andral** has often seen them in the hearts of measly pigs, and only once in the human heart. **Otto** saw them protruding into the right auricle in one case; and in a man who died of diseased testes, he detected "a heap of hydatids on the Eustachian valve, hanging by several threads into the right ventricle." These, however, were probably only a cluster of simple cysts. Mr. **South** states, that, at St. Thomas's Hospital, there is a heart with a cyst on its apex, as large as a hen's egg, which was filled with hydatids. Watery cysts and hydatids have been found not only under that part of the pericardium reflected over the heart, but also either attached to the inner surface of the bag of the pericardium itself, or lodged between its layers.

237. *D. Tumours* of various kinds are noticed by the older writers as having been found in the substance of the heart. But, owing to their deficient anatomico-pathological knowledge, and to loose or defective descriptions, the exact nature of these is unknown. To these belong the cases recorded by **Rhodius**, **Schenk**, **Columbus**, and **Bonet**; and those collected by **Lieutaud**.—Tumours of a *steatomatous* nature have been observed by **Penada**, **Fleisch**, **Sprengel**, and **Otto**; and others, of a *melicerous* and *gritty* kind, by **Morgagni**, **Walter**, **Arndt**, and **Cruveilhier**. **Otto** states, that he has seen a flat gritty tumour in the substance of the right ventricle of an old woman; and five or six encysted tumours, the size of hazel-nuts, in the left ventricle of a young man. In an officer, who was the subject of chronic hepatitis, dropsy, &c., the slightest exertion producing severe palpitation, hurried and oppressed breathing, and a sharp irregular pulse, the heart was enlarged, and presented a large encysted tumour on the right auricle, the aorta being ossified at several points. (*Catal. of Prepar. in Mus. Fort Pitt, &c.* p. 36.)

238. *E. Sarcomatous Formations*, and *Medullary Sarcoma* or *Encephaloid Productions*, have also been found in both the heart and pericardium. **Otto** remarks, that *sarcoma* occurs—1st, as single little roundish knots, deposited between the layers of the valves;—2dly, as white condylomatous growths on the inner surface, and especially on the valves;—and, 3dly, as spheroidal, smooth, tolerably large, and solid growths, or true sarcoms. The *first* is common: and instances of the *second* are recorded by **Lancisi**, **Bonet**, **Morgagni**, **Sandifort**, **Testa**, **Laennec**, **Desruelles**, &c. **Corvisart**, **Scarpa**, and some others, consider them of a syphilitic nature; whilst **Bertin** and **Bouillaud** controvert this opinion. **Otto** states that he has met with them large, grape-like, or in the form of a cock's comb or cauliflower, both in syphilitic and in other persons. **Bouillaud** views these formations as the consequences of modified states of chronic inflammatory action. The *third* variety is most rare. It has been observed in either surface, and in the substance, of the heart, by **Forlani**, **Blancard**, **Soemmerring**, **Otto**, **Rigacci**, **Nasse**, and others. **Meckel** found fifteen of these productions, from the size of a pin's head to that of a hazel-nut, partly within, and partly without, the heart. **Testa** found them in the heart of a person long afflicted with syphilis. Mr. **South** states, that, at St. Thomas's Hospital, on the interior of the right auricle of the heart of a man, who had a sarcomatous growth in the nostrils, there were two similar productions, one as large as a bean, the other as a pea.

239. *F. Medullary Sarcoma*, or *Fungoid Disease*, in modified forms, may implicate the heart or pericardium, or both. As in the case of tuberculous deposits, it is observed principally in cases, where this disease had previously appeared in other parts of the body. **Bartzky** found it on the anterior and upper part of the heart; **Segalas d'Etchpare**, in a boy; **Cruveilhier**, in an old man; **Ollivier**, and several authors quoted by **Otto**, in persons advanced in life. In all these, there were similar tumours in other parts, and the muscular structure of the heart was chiefly affected. When this disease is seated in either the posterior or the anterior mediastinum, the pericardium may be penetrated by it, and the heart itself implicated. This was observed in the case of a woman whose arm had been amputated on account of this malady (**Gerson** and **Julius**, *Magaz. der Ausl. Liter. d. g. Heilk.* September, 1823, p. 199.). The pericardium was involved in it, in a case which lately fell under my observation. The disease was seated in the mediastinum, and extended not only to the pericardium, but also to the sternum and ribs; its nature being recognised during life. In a case published by M. **Velpeau**, encephaloid tumours were found in the substance of the heart, in the lungs, between the pleura and ribs, in the bronchial glands, under the mucous membrane of the stomach, in the duodenum, in the pancreas, and right kidney, in the liver to the number of some hundreds, between the tunics of the gall-bladder, in different parts of the peritoneum, on the upper surface of the brain, in the thyroid gland, and under the skin, and in the muscles of the right thigh. The aorta also was completely obstructed by fungoid masses.

240. M. **Andral** twice saw this disease in the right side of the heart. In the first case, the patient presented signs of hypertrophy of the left ventricle. In addition to this, almost the whole of the right ventricle and auricle were converted into a firm, dirty white substance, traversed by a number of reddish lines, and possessing all the characters of the encephaloid substance. The second case was that of a man of middle age, who had enjoyed good health till two years previously, when he became slightly asthmatic. He continued in this state for five or six months, when he was suddenly seized with the most excruciating pain, confined at first to the region of the heart, but soon extending over the left side of the thorax. His dyspnœa increased, and he had violent palpitations and vomiting. The pain abated after an hour, and the next day he was as usual. During the following year the dyspnœa increased, and the pain returned seven or eight times. He afterwards became much emaciated, had a peculiar sallow tinge, and evening exacerbations of fever. The attacks of violent pain were now frequent, but of short continuance. He had also occasional attacks of palpitation, but there was no stethoscopic

evidence of disease either in the heart or lungs. After some time he became œdematous, and died suddenly. The wall of the right ventricle was occupied by a large knotted tumour, extending from the apex to the base, projecting very much externally, and protruding internally into the ventricle. The encephaloid substance composing it was firm in some points, and soft and diffluent in others. (*Anat. Path.* t. ii. p. 347.)

241. *G. True Scirrhus and Carcinoma* of the heart are, according to Otto, still doubtful. Where the evidence of either has been most conclusive, there has also been scirrhus or carcinoma of other parts. Open carcinoma of the heart can hardly exist, as death will take place before the disease can proceed to this stage. Most writers, especially foreign pathologists, have confounded true carcinoma with fungoid or encephaloid disease; and cases have been recorded as examples of the former, when they were really instances of the latter. Of this kind are the cases adduced by Laennec, Velpeau, Andral, Cruveilhier, Ollivier, &c.—Bayle and Cayol never met with an instance of scirrhus of the heart. I have seen scirrhus in the lungs and *pericardium* in one case, and in the pleura and pericardium in another, scirrhous and carcinomatous disease having long previously existed in other parts of the body. M. Billard found, in an infant only three days old, three tumours embedded in the heart, possessing the characters of scirrhus. I doubt, however, their being actually scirrhus. M. Recamier observed the heart partially converted into a substance resembling the skin of bacon in a person who also had cancerous tumours in the lungs. Cases of a more doubtful description are recorded by Carcassone and Duchateau. Rullier states that he found cancer in the heart of a person who had this malady in other organs; and a somewhat similar instance is recorded in the *Révue Médicale* (t. i. 1824, p. 272.).

242. *H. Melanosis* has also been found in the heart and pericardium; but, in all the instances of this kind on record, this production has existed also in other parts. — As to the *Treatment* of adventitious productions in the heart, it is unnecessary to offer any remarks.

243. ix. Of Polypous Concretions in the Cavities of the Heart. — Bartoletti and Pisini were the first to impose the name of *polypi* on those concretions of lymph and fibrine which are sometimes found in the cavities of the heart and large vessels after death. Kerkring first contended that these concretions were different, in their nature and mode of formation, from polypi of the uterus and nasal fossæ, to which Bartoletti and Pisini had likened them. But with Kerkring originated the distinction of them into *false* and *true polypi*, — the former consisting of a *post mortem* coagulation of the fibrinous part of the blood, the latter presenting a consistent cellular or organised appearance, and being formed during the life of the patient. This distinction was first questioned by Morgagni, who denied the existence of true polypi of the heart, and in this opinion he was followed by Lieutaud, Pasta, and others. On the other hand, Manget, Malpighi, Pechlin, Peyer, F. Hoffmann, and Fantoni maintained that the polypous concretions found in the cavities of the heart were to be regarded as the more immediate cause of death, and not as having been formed at the time of death. The opinions of pathologists, however, remained long divided on this point, until Corvisart, Testa, Burns, Bertin, Kreysig, Laennec, and others investigated it somewhat more closely, and ascertained that, although these concretions occasionally form about the time of death, or immediately afterwards, there are others of a different kind, which are produced during the life of the patient, and occasion very severe symptoms referrible to the heart, but not of a kind which generally admit of a precise diagnosis.

244. *A. Of the Formation and Kinds of Cardiac Polypi.*—Polypous concretions are most frequently observed in the right cavities of the heart, and oftener in the auricles than in the ventricles. This is explained by the circumstances which favour their production; especially the stasis of the blood in the auricles, the state of the blood when it reaches the right auricle, and the extension of inflammatory action from the venous trunks. These three principal causes are especially concerned in the production of *three kinds* of concretions. — In the heart as well as in the veins, and even in the arteries, the fibrinous parts of the blood may concrete — 1st, from a condition purely mechanical; — 2dly, from an altered state of the blood itself, especially from the passage of morbid matter into it; — and, 3dly, from inflammatory action.—Each of these, as being especially concerned in the production of three varieties of cardiac polypi, requires a detailed consideration.

245. *a. Simple fibrinous concretions — the false polypi* of former writers — are frequently found in the right cavities of the heart, and sometimes extend into the vena cava and pulmonary artery. They are occasionally entangled in the columnæ carneæ; but they have no organised or intimate connection with any part of the internal surface of the heart with which they are in contact. They consist of an inorganised accretion of the fibrinous and albuminous parts of the blood; are of an uniform colour, easily torn, and generally met with in patients who have died of chronic diseases; characterised frequently by a deficiency of the red particles of the blood, or, in cases of marasmus, great debility, or cachexy, and which have been accompanied by obstacles to the circulation, as from disease of the valves and orifices of the heart. These concretions may commence during the last moments of existence, or immediately upon dissolution. In cases of mechanical obstacle to the circulation through either the heart or lungs, the fibrinous parts of the blood may concrete in the right side of the heart so as to prevent the continuance of its action. The same result may also follow the remora or stasis of blood in the right auricle and vena cava, consequent upon extreme depression of the powers of life, or upon prolonged syncope, &c.; the concretion thus formed preventing the restoration of the heart's contractions. Under such circumstances, this variety of concretion may be the proximate cause of death. although formed so shortly before, especially in diseases of the heart, and during extreme vital prostration.

246. *b. Fibrinous concretions from the passage of morbid secretions into the blood.* — During languid states of the circulation, or when the fibrinous parts of the blood are disposed to coagulate, the passage of pus, or of the more consistent morbid

secretions, into the veins, occasionally determines or gives occasion to this act; the morbid matter carried into the circulation being the nucleus around which the fibrine concretes, especially in the situations, as the right side of the heart, most favourable to this occurrence. When a partial coagulation of fibrine is thus occasioned during the venous circulation, the concretions, at first small, often become entangled in the fleshy columns of the right side of the heart, and undergo changes arising — 1st, from the concentric deposition of additional layers of fibrine, as in the cavities of aneurisms; — 2dly, from their age or duration; — and, 3dly, from the effects they produce on the parts with which they are in contact. — (*a*) Upon dividing these concretions, the appearance of concentric layers of fibrine becomes manifest; and in the centre, either pus, or tuberculous matter, or a substance resembling a minute coagulum, is observed. — (*b*) The colour and consistence of these concretions depend chiefly upon their age. In the more recent cases, they nearly resemble those already described, and are soft or easily torn. Those of longer duration are more evidently disposed into concentric layers, more firm and fibrous, and generally of a paler tint; but varying from a greyish colour, to a greyish red or flesh-colour. — (*c*) When they are of considerable size, or of long duration, they appear to have compressed the fleshy columns in which they are entangled, and ultimately they become adherent, in one or more points, to the internal surface of the heart, in more immediate contact with them. This adhesion is manifestly owing to the irritation they have occasioned in this surface, and at these points, and to the consequent exudation of lymph, by which they become agglutinated, and more or less closely adherent. — (*d*) In this variety of concretion, there are neither blood-vessels nor vascular connections with the surface to which they become adherent, — circumstances readily explained by the modes of their production, and of their consecutive agglutination. At the same time, such adhesions are merely contingencies, and very frequently do not occur, especially in the more recent concretions. The form and size of these concretions also vary remarkably.

247. *c. Polypous concretions consequent upon internal carditis.* — Whilst the two preceding varieties of concretion are generally observed in the right side of the heart, that about to be considered is most frequently met with in the left; inflammation attacking this side of the organ, oftener than the right (§ 65. 68.). — This variety varies much in size and in firmness. It may not much exceed the granulations or excrescences described above (§ 66.), or it may be so large as to nearly fill one of the cavities. In its more recent state, it is generally amorphous, resembling concrete lymph, or the buffy coat of the blood, glutinous, and slightly adherent to some part of the internal surface, or of the fleshy columns or tendons of the valves. But, when it has been of considerable duration, it is more firm, fibrous, or cellulo-fibrous, in its structure, and more firmly adherent to the internal membrane, with which it seems as if continuous. In some cases, blood-vessels may be traced through this variety of concretion, and their communication with those of the heart's internal surface may be demonstrated. When this form of concretion is of considerable size, there is every reason to suppose that it is not altogether, or even chiefly, formed of the lymph exuded from the inflamed internal surface, as the quantity of lymph thus effused cannot be more than will give rise to the granulations, excrescences, or vegetations, already noticed (§ 66.) But the lymph thus exuded, during a languid circulation, or states of the blood favouring coagulation, attracts and disposes the fibrine to concrete around it; and polypi of great size, sometimes disposed in layers, as the second variety, may thus be formed. — The firmness and cohesion of these polypi vary considerably, but their cohesion has no reference to the intimate nature of their connection with the heart's surface; for, in some cases, where the polypus was very soft, vessels could easily be traced from the heart into it, and these so large as to admit of injection (RIGACCI, in *Bullet. des Scien. Méd.* Sept. 1828; BERTIN, *Traité des Mal. du Cœur, &c.* p. 448.); whilst in other instances the polypus has been firm, intimately adherent to, and apparently forming a continuous structure with, the surface of the heart, and yet the existence of blood-vessels was not apparent. That this variety of concretion originates in inflammatory irritation of some part of the internal surface of the heart, is proved by the history of the cases in which it has been met with, and by the appearances exhibited upon dissection. — From the foregoing division and description of these productions, the diversity of opinions which has long existed as to their formation will be readily accounted for.

248. *B. Of the Signs of Cardiac Polypi.* — About the end of the last century, polypi of the heart were considered a frequent occurrence, and many of the disorders of respiration and circulation were attributed to them. J. J. ROUSSEAU took a journey to Montpellier to be treated for this disease, and, according to M. BOUILLAUD, upon foot, which he could not of course have done if he had been the subject of it. — It is evident that the symptoms will vary according to the situation, size, and origin of these formations — to the degree to which they extend into or fill up the cavities of either side of the organ. MALPIGHI, SENAC, SAUVAGES, and BURSIERI have entered very fully into the diagnosis of these concretions, but no reliance can be placed upon what they have adduced respecting it. Even the more recent observations of LAENNEC, HARTY, and others have not much advanced our knowledge. M. BOUILLAUD remarks, that it is necessary for them to have attained so great a size as to notably impede the circulation, before they can be possibly recognised during life. They do not, however, equally impede the flow of blood through the cavities in all the situations in which they may be placed. The concretions which are attached to the valves, or to their tendons, the other circumstances being the same, cause the greatest interruption of the circulation. When they occupy the right cavities, as most frequently is the case, the blood is sent in diminished quantity to the lungs, and accumulates in the venous trunks, causing congestion of the liver, brain, abdominal viscera, &c.; effusions into shut cavities and cellular parts; and asphyxy from deficient aërification of the blood, if the supply of blood to the lungs be much lessened. When they form in the left side

of the heart, the phenomena are, in some respects, the same; but congestion of the lungs is a necessary consequence, with dyspnœa, effusions into the bronchi, or substance of the lungs, &c.

249. According to LAENNEC, the sudden supervention of an anomalous, confused, and obscure pulsation, in a patient who previously had presented a regular action of the heart, should lead to the suspicion of a polypous concretion; and if this disturbance takes place on one side only, this indication is almost certain. M. BOUILLAUD considers that the concretions consequent upon internal or external carditis, are indicated by tumultuous pulsations of the heart, with a dulness or obscurity of the attendant sounds, or with a simple, or hissing bellows sound; by oppression, dyspnœa, or orthopnœa, and extreme anxiety, followed by venous congestions, and leipothymia; and by coma, stertorous breathing, convulsive movements, an indistinct and very small pulse, and coldness of the extremities. When these phenomena are manifested in the course of an acute disease of the heart, particularly during internal carditis, in which there had previously been but little irregularity and oppression of the respiration and circulation, the existence of a polypous concretion is very probable, and especially if the sounds of one or more of the cavities are much diminished or obscure. — In chronic diseases of the heart, attended by habitual dyspnœa, the occurrence of an insupportable orthopnœa and anxiety, with obscuration of the sounds, restlessness, coldness and lividity of the face and extremities, and occasionally vomiting, also indicate the formation of concretions, especially if these symptoms have supervened without an obvious cause; and in this case it is very probable that the concretions exist in the right cavities.

250. C. The *Prognosis* and *Treatment* of polypous concretions require but few remarks: the former is always extremely unfavourable. Indeed, it is doubtful whether recovery ever takes place from them, — at least, when the indications of their existence are tolerably conclusive. M. BOUILLAUD, however, takes a more favourable view of the issue of such cases; and thinks that the more recent, and those which are not of large size, may be dissolved. This writer and M. LEGROUX suppose that attempts should be made to *prevent* the formation of these concretions in diseases of the heart — both in those which consist chiefly of interrupted circulation, and in inflammatory action. With this view they recommend small bloodlettings from time to time, and diluents. It is probable that the disposition of the fibrinous portions of the blood to concrete may be counteracted by the exhibition of mercurials, by the liquor potassæ and the subcarbonates of the alkalies, and particularly by the sub-borate of soda. This last substance I have found the most certain in preventing the coagulation of fibrine, and in dissolving lymph; and it may, therefore, be prescribed with advantage, not only in the inflammatory diseases of the heart, but also where here is reason to suspect the formation of polypous concretions.

251. x. OF RUPTURES OF THE HEART. — *A. Seat and History of, &c.*—Rupture of the heart was first observed by HARVEY. LANCISI and MORGAGNI showed that instances of sudden death were frequently owing to this cause. As examinations after death became more frequent, cases of this occurrence were more commonly met with; and at the present epoch of pathological research they are by no means rare. — MORGAGNI (*Epist.* xxvii. 10.) remarked that rupture of the left ventricle is more common than that of the right; and that this latter is more frequent than rupture of the auricles: this is confirmed by the particulars of the cases which have been since recorded. M. OLLIVIER states, that, out of 49 instances, the rupture was seated in the left ventricle, in 34; in the right ventricle, in 8; in the left auricle, in 2; and in the right auricle, in 3; and that, in 2 cases, both ventricles presented several ruptures. The results are, however, different in respect of ruptures occasioned by external violence. In 11 instances of this description, the right cavities were torn in 8; and the left in 3. In these 11 cases, the auricles were torn in 6.

252. In the above 49 instances of spontaneous rupture, the apex was found to be its seat, in 9; this lesion in the others being nearer the base of the organ. The directions of the lacerations were various: in some the laceration was transverse or oblique, — in others it was longitudinal or in the direction of the fibres, or of the axis, of the organ. In certain cases, it was extensive on the external surface, and very small internally. In other instances the reverse was observed. The laceration may occur obliquely through the parietes, and resemble a sinus, as remarked by MORGAGNI. It may even be incomplete, some of the stretched fibres still remaining and concreting the opposite edges (ROSTAN). It may also resemble the perforation made by a bullet. It may, moreover, involve only one or two of the muscular layers, without penetrating into the cavity; and it may be limited to a few fasciculi of fibres, or to the fleshy columns, or even to the valves.— When there is no apparent alteration of the tissue at the place of rupture, it is difficult to determine whether or not it has taken place from within outwards, or in the opposite direction. — The most singular circumstance, in the history of this lesion, is the occasional occurrence of two or more lacerations, in different degrees, in the same heart. M. OLLIVIER, upon examining into the particulars of the most authentic cases, found eight in which there were several ruptures, either in the same ventricle or in both. M. ROSTAN detected two lacerations in the left ventricle; MORGAGNI, three in the same situation; PORTAL, the same number in the same place; Dr. ASHBURNER, two in the left ventricle, and one in the right; M. BLAUD found two penetrating the ventricles, two involving only the superficial layer of the left, and one the external layer of the right ventricle; and M. ANDRAL observed five in the left ventricle, and a perforation of the stomach in the same patient.—Frequently, when the substance of the organ is torn, some of the fleshy columns corresponding to the rupture are also torn. In some instances the fleshy columns are alone torn, the parietes of the ventricles remaining entire. In this case the derangement of the circulation becomes extreme, especially if the tendinous cords attached to the free margin of the valves are ruptured (OLLIVIER). Instances of this kind are recorded by CORVISART, LAENNEC, BERTIN, ADAMS, and others. Ruptures of the heart have

been arranged as follows by DEZEIMERIS:—1st. Rupture from external violence; — 2d. Spontaneous rupture without previous lesion of the tissues of the organ; — 3d. Ruptures consequent upon dilatation; — 4th. Ruptures with *probable*, but not with demonstrable, lesion;—5th. Ruptures owing to softening of the heart; — 6th. Ruptures from abscess;—and, 7th. Ruptures caused by ulceration, or perforation of the heart. M. OLLIVIER has adopted a somewhat similar plan to the foregoing in his treatise on this subject.

253. *a. Rupture of the Heart without previous Lesion*, or without demonstrable lesion, is comparatively rare. In the cases recorded by PLOUCQUET and FISCHER the rupture was preceded by severe pain, continued or remittent, in the left shoulder, and about the margin of the left shoulder-blade, and shooting down the arm, and left side of the thorax, and attended by a sense of laceration, pressure, and anxiety at the præcordia and epigastrium, sometimes with numbness and prickings in the shoulder and arm. — In other instances, as in those published by PORTAL, BARON, and ANDRAL, death has occurred without any previous ailment, excepting dyspnœa, which was observed only in the case recorded by PORTAL.

254. *b. Rupture consequent upon Narrowing of the Orifices*, with or without hypertrophy or dilatation of the cavities of the heart, is a more frequent occurrence than the foregoing. MORGAGNI has adduced several instances, in which the laceration was consecutive of alterations at the origin of the aorta. HALLER has cited a similar case; and others have been recorded by PORTAL, ROSTAN, and DEZEIMERIS. In a case published by CHAUSSIER, in which death occurred during a dispute, the aorta was found constricted at its origin by a cartilaginous tumour which surrounded it. There can be no doubt that an obstacle to the circulation at the heart's orifices will favour rupture of the cavity behind it; and that laceration may occur, although the parietes of the cavity are hypertrophied. Instances of this latter occurrence have been published by MORGAGNI, ROSTAN, and others. MORGAGNI supposed that, when the rupture is connected with hypertrophy, it takes place in that portion of the parietes which is the least thickened and resistant. But this is not always the case; for the rupture has been observed in the most hypertrophied part. M. CHOMEL supposes that, when this has occurred, the ventricle has been almost equally thickened and resistant throughout, and that the part torn, although the most hypertrophied, has been actually the weakest. If the sole cause of rupture were a distending force, or even the resistance furnished by the contents of the cavity to the contraction of its parietes, in forcing the contents onwards, then might tbe laceration take place in the weakest part; but the rupture does not always occur in this way; for it is reasonable to infer that the same circumstances as occasion increased action and consequent hypertrophy, will sometimes produce laceration, when their increase is rapid, or the obstacle to the circulation through the cavities of the heart insurmountable; and that hence the muscular structure is torn by its own excessive action at the very part where the contraction is most energetic.

255. *c. Dilatation* of the cavities might at first appear more frequently connected with rupture, than hypertrophy has been found to be, laceration of the parietes following the extreme or sudden dilatation of them; but this connection has been even less frequently observed than the preceding. Instances of it have, however, been adduced by MORGAGNI, MARTINI, and SCHÆFFER. Local or partial dilatation might also appear frequently to terminate in rupture of the dilated part: but this is also a rare termination, as the adhesion of the part to the pericardium, or the formation of fibrinous layers in the interior of the sac, prevents it from being so easily torn as it otherwise would be. M. OLLIVIER remarks, that of nineteen instances of local dilatation, rupture occurred only in the three cases recorded by GALEATI, PENADA, and BIGNARDI.

256. *d. That Rupture should be favoured, or occasioned, by partial or general Softening of the Substance of the Heart*, will be readily conceded; and several cases are recorded in illustration of the occurrence.—In all these the softening was great, although varied in its characters: in some it has been denominated *gangrenous*, particularly by the older writers; in others *apoplectic*, by CRUVEILHIER (*Anat. Path.* fasc. iv.); and in others *gelatiniform*, or *senile*, by BLAUD. Of the second of these varieties, instances have been adduced by TENGMALM, CORVISART, and ROCHOUX. M. OLLIVIER states, that the thesis of this last writer contains several cases of this kind of rupture.— Instances of the third variety of softening terminating in laceration are published, in the places referred to below, by HAZON, and others. In a case by S. FRANK, this alteration appears to have arisen from lesion of the *nervi vagi*; and in one by HODGSON, the softening and atrophy seem to have followed obliteration of the coronary arteries.— Rupture has also been occasioned by the softening attendant upon fatty degeneration of the heart (§ 224.). MORGAGNI, SCHMUCKER, and ADAMS, have recorded cases in which this form of softening had terminated in laceration.

257. *e. Abscess in, or Ulceration of, the Muscular Structure of the Heart has also been found to have terminated in Rupture.* — In cases recorded by MORGAGNI, PORTAL, BRERA, LANGLADE, and H. CLOQUET, *ulceration* had partially penetrated the parietes of one of the cavities, the remaining layer being torn by the distension, or resistance, of the contents of the cavity. Instances of *abscess* of the structure of the organ recorded by ERDMANN and MOTT, and quoted by DEZEIMERIS, terminated in a similar manner to the foregoing, — the termination admitting of the same explanation.

258. *f. The Rupture may be partial, or confined to one or more Layers, or muscular Fasciculi, or tendinous Cords of one or more Cavities*, as stated above, and as shown by CORVISART, and confirmed by LAENNEC, BERTIN, ADAMS, and others. — In the three cases recorded by CORVISART, the rupture appeared to have been occasioned by violent physical efforts. BERTIN detected rupture of one of the fleshy columns of the right ventricle, and attributed it to violent fits of cough. LAENNEC found one of the tendinous cords attached to the free margin of the mitral valve torn across; and Dr. CHEYNE met with another instance of rupture of one of these cords in a person affected with dilatation and hypertrophy of the left ventricle. — Cases in which rupture of the *fleshy columns* and *tendinous cords* have occurred, have

likewise been observed by BOUILLAUD, TOWNSEND, and others.

259. *g. Ruptures of the Valves* are not infrequently met with, as a consequence of fragility arising from induration and ossification, or from softening caused by inflammatory action; but previous disease is not always necessary to the production of this rupture, especially when it is produced by external violence, or by sudden and violent physical efforts. When, however, it is consequent upon slighter grades of these causes, or upon mental emotions, previous disease of the valves, or of the orifices, or of the internal surface, of the heart may be inferred; otherwise they would have been inadequate to its production. If the rupture of the valve be partial, the patient may live a considerable time afterwards; but extensive chronic disease will be the result, owing to the local irritation, and to the imperfect function of the valve, particularly further structural change of the ruptured valve, dilatation, or dilatation with hypertrophy, of the chambers of the heart, &c. When the rupture is extensive, and has been favoured by existing structural change, death either follows almost instantly, or takes place in a short time. When the rupture is partial, the patient may live for a considerable time, with the symptoms of insufficiency of the valves (§ 76. 198.).

260. *F. Rupture of the Heart from external Violence* is not a rare occurrence. Contrary to what is observed in respect of spontaneous rupture, the laceration occasioned by external force is more frequently seated in the right, than in the left, side of the organ; and much more commonly in the auricles, than in the ventricles. As M. DEZEIMERIS has argued, it is very probable that the mode in which the rupture is produced by external injury, depends much upon the nature and seat of the injury. When the region of the heart, or the thorax, is the seat of the external violence, the rupture takes place in the cavities possessed of the weakest parietes, and in the most yielding points of these: but when the injury is of a kind to prevent the heart from evacuating its contents, as in the case of a carriage-wheel passing over the trunk, or of any heavy body pressing upon the aorta, the muscular efforts of the ventricles to expel their contents, may occasion either a partial or complete rupture of them, or of the vessel at some point between the heart and the part pressed upon.

261. *B.* The *Causes of Rupture of the Heart*, especially the most material, and those connected with the pathological states of the organ, have been already stated, and explained under distinct categories. There are, however, various other causes which determine, aid, or accelerate these in their operation. Violent mental emotions, particularly anger, fright, terror, unexpected disappointments, distressing intelligence suddenly communicated, anxiety, &c.; sudden and violent muscular efforts, and laborious or prolonged physical exertions of any kind, particularly in constrained positions. The act of coition and straining at stool have often occasioned rupture; a very large proportion of the cases of it on record having been attributed to these causes. M. OLLIVIER states that rupture of the heart occurs more frequently in men than in women; but this is not satisfactorily determined. It is certainly more common in persons far advanced in life, than in the young. M. BLAUD considers the rupture that takes place in old age, as generally the consequence of softening of the heart. Several cases recorded by him, and by other writers, confirm this; and those adduced by CRUVEILHIER and SMITH further show, that softening terminating in rupture of the left ventricle is often accompanied, in old persons, with great accumulation of fat on the surface of the organ.

262. *C. Symptoms* and *Diagnosis.* — *a.* The cases hitherto recorded throw but little light on the diagnosis of this lesion. Some of these have furnished proofs of disease of the heart for a longer or shorter time: whilst others, up to the hour of death, had complained of no symptom indicative of any affection of the heart or large vessels. In the instances recorded by PLOUCQUET, OLMI, CHARPENTIER, and FISCHER, the patients complained, for a short time before death, of a violent pain in the left shoulder, extending to the arm, and occasionally to the whole side; attended, especially at last, with more or less numbness, and characterised by exacerbations and slight remissions. In some cases, inexpressible anxiety and pain have been felt in the præcordia and epigastrium, with cold extremities and cramps, shortly before dissolution. In the majority, rupture has produced instant death; but in some this has not been the case. In the instance adduced by J. FRANK, life was prolonged twelve hours, probably from a coagulum filling up the laceration for a time. In a case recorded by RUST, the rupture was produced by the passage of a carriage-wheel over the chest, and was seated in the right auricle; yet the patient survived fourteen hours.

263. In most of the cases in which the rupture is preceded by violent pain, M. OLLIVIER thinks that it is produced gradually, from the successive laceration of several layers or fasciculi of muscular fibres; and that the pericardium becomes only gradually distended by the effused blood. Where the laceration and aperture are at once large, a copious effusion instantly occurs, fills the pericardium, and abolishes the contractions of the organ.

264. *b.* When the rupture is seated in the *partitions between the auricles or ventricles*, a fatal result may not very rapidly occur. In this case, the venous may be mixed with the arterial blood; although this may take place only to a small extent.— *c.* In the three cases of *rupture of the fleshy columns* detailed by CORVISART, a sudden oppression and sense of impending suffocation was the first symptom complained of. The pulse became unequal, irregular, and intermittent; and the pulsations of the heart confused. This state of distress and anxiety may continue for some days, before it terminates in death; or it may endure much longer, and be accompanied with various signs of organic disease of the heart.— *d. Rupture of the valves* will necessarily be attended by much irregularity or disorder of the circulation, and by a simple, or hissing, or musical bellows sound. (BOUILLAUD, FARRALL.)

265. As the *diagnosis* of rupture of the fleshy columns and valves of the heart, in the present state of our knowledge, is very imperfect; and as the signs of rupture of the parietes of one of the cavities are equivocal; nothing can be adduced as

to the *Treatment* of these lesions. Indeed, in most instances, medical interference will be quite unavailing; and even as much mischief as benefit may result from it.*

266. xi. Alterations of the Bloodvessels of the Heart.—The coronary vessels are more or less enlarged in hypertrophy of the heart, and diminished in atrophy. Some writers have supposed that the smallness of the vessels in the latter lesion is actually the cause of it; but the state of the vessels is solely dependent upon the nutrition of the organ. Portal (*Anat. Méd.* t. iii. p. 74.) found the coronary veins dilated and varicose; and the larger trunks have contained polypous concretions (Kreysig). The coronary trunks, both veins and arteries are always very much, and progressively, enlarged with the accession of age, as shown by M. Bizot. The most common alterations, however, of the cardiac vessels are cartilaginous and ossific formations in the *arteries*. These, especially the ossific deposition, may consist merely of small isolated patches, or they may nearly or altogether surround the vessel. Ossification may extend along the greater part of an artery, or to two or more. Generally, the canal of the vessels is uninterrupted, although the parietes have become quite inert. Cases, however, have occurred in which the canal has been obliterated. Instances of extensive ossification of the cardiac arteries have been recorded by Parry, Ring, Portal, Hodgson, and others; and have been usually found associated with softening, flaccidity, or some other change in the nutrition of the organ. Angina pectoris has been supposed to depend upon this change; but numerous instances of ossification of the coronary arteries have been met with without this complaint, or, indeed, any symptom referrible to the heart, having existed.

267. xii. Communication between the Sides of the Heart. — This lesion is most frequently congenital, or the result of malformation, or imperfect development of the organ. It occasionally increases suddenly about the period of puberty. M. Bertin (p. 436.), and M. Bouillaud (t. ii. p. 564.), however, believe that it is not unfrequently a consequence of ulcerative perforation; whilst M. Louis maintains that it very rarely arises from this latter cause. The communication may exist through the interauricular, or through the interventricular partition, or through both at the same time. Bouillaud remarks that, in many cases, the *opening in the interauricular partition* is a persistent state of the *foramen ovale*; but, in others, that it is consequent upon ulceration, particularly when it occupies a situation different from that in which the oval foramen is always found, and when there are more than one perforation. The communication in this situation is generally by a rounded opening, with smooth, sometimes thick and tendinous, margins, commonly of from four to six lines in diameter, but sometimes of nearly double this size. The *perforation of the interventricular partition* is found in various situations, but most frequently at the junction with the partition of the auricles, and towards the insertions of the pulmonary artery and of the aorta. The form of the openings is commonly round, and the diameter is the same as those of the interauricular partition, the margins presenting the same polished and fibrous appearance.

268. The state of the valves and orifices of the heart, in cases of communication between the opposite cavities, is important. Of fifteen cases, detailed by Bouillaud, the valves were indurated, thickened, corroded, or perforated in twelve; and, in ten of these twelve, the orifices to which these valves belonged were more or less contracted. In eight of the twelve cases, these lesions affected the right; in three, the left valves and orifices. In five of the eight cases, they were seated in the pulmonary valves; in two, in the tricuspid valve; and, in one, in both the pulmonary and tricuspid. Of fifty-three cases of cyanosis noticed by M. Gintrac, similar lesions to the above were found in twenty-seven; and in all these latter, they were seated in the right side of the organ; twenty-six being at the orifice of the pulmonary artery, and one only in the auriculo-ventricular orifice. The contractions of the orifices and lesions of the valves, in these cases, did not differ from those described above (§ 67,213.). The greater frequency of the narrowing of the right orifices, particularly that of the pulmonary artery, in cases of communication between the opposite cavities, is deserving notice. This lesion M. Louis considers to be congenital. M. Bouillaud believes it to be, in some cases, caused by inflammatory action.

269. In eleven of the fifteen cases given by M. Bouillaud, the heart was enlarged, dilatation, with hypertrophy, having existed in the right side. Dilatation of the right auricle was observed in ten cases; and, in most of these, the parietes of the auricle were also thickened. Hypertrophy of the right ventricle was met with in ten cases; and, in four of these, the hypertrophy was concentric. The left side of the heart presented nothing anormal, excepting the induration of the valves, and narrowing of the orifices, in the three already noticed (§§ 268.). In the twenty cases reported by M. Louis, nearly the same appearances as in those of M. Bouillaud were observed. Dilatation of the right auricle existed in nineteen, six times with hypertrophy, and twice with thinning of its parietes. Dilatation of the right ventricle was observed in ten, hypertrophy in eleven, and both dilatation and hypertrophy in five instances; whilst, on the left side, dilatation of the auricle occurred thrice, that of the ventricle four times; and hypertrophy of the former twice, and that of the latter thrice only. (*See* Blue Disease, § 8.)

270. In some instances, communication between the opposite sides of the heart is associated with other *lesions of malformation*; as the connection of the aorta with the right ventricle (Ribes), or with both ventricles (Louis), the persistence of the ar-

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* The only instance on record, showing the possibility of recovery, more or less partial, from rupture of the heart, has been published by Rostan; but some mistake may have existed as to the morbid appearances. The case is, however, very interesting. — A woman had experienced, fifteen years previously to death, a violent pain in the præcordia and epigastrium, extending to the back, and returning at intervals. She was afterwards subject to palpitations, followed by syncope. Her death was sudden. The pericardium contained blood effused in its posterior part, but was adherent to the heart anteriorly by several albuminous layers. On removing it, an irregular rupture, an inch and a half in length, and quite recent, was found; but, to the left of this, and at a distance of six lines, the substance of the organ was destroyed, and replaced by a fibrinous concretion, entirely similar to those found in aneurismal sacs, and intimately connected with the structure of the heart. The ventricle was thinned in this situation. The latter appearance was attributed to a rupture which had taken place at a long bygone period.

terial canal, &c. (See BLUE DISEASE, § 8.) The state of the *pericardium* has been noticed in a few only of the cases of this description; and in these alterations depending upon chronic pericarditis, and effusion of a serous fluid, were chiefly observed.

271. The *symptoms* of the lesion under consideration are generally equivocal; for, as it is generally associated with disease of the valves and orifices, and with dilatation and hypertrophy of the corresponding chambers of the organ, it becomes difficult to separate the phenomena actually depending upon these lesions from those arising from the communication between the opposite cavities. The palpitations, dulness on percussion of the præcordial region, the purring tremor, the bellows or saw-sound, the faintings, sinkings, oppression, &c., the irregularity and smallness of the pulse, the venous and serous congestions, &c., observed in these cases, are manifestly owing to these associated lesions. That more or less admixture of the venous and arterial blood results, in consequence of the communication, must be admitted. M. LOUIS thinks that it takes place chiefly on the entrance of the blood into the communicating cavities, and on the departure of the blood from these cavities, when the natural orifice is more or less constricted.

272. Blue discolouration of the skin (See BLUE DISEASE) has been attributed to this communication; but it is not always observed, and it is rarely universal. Sometimes it is not remarked, even in the countenance, till the last period of the patient's life. This change of colour is to be attributed as much to the obstacle to the circulation of the venous blood, as to the communication between the opposite sides of the organ; and this communication has generally existed a considerable time before the health has been very remarkably affected. The symptoms assigned to this alteration, particularly blue discolouration, leipothymia, great sensibility to cold, oppression and suffocation in the thorax, are chiefly an aggravation of those observed in other diseases of the heart, and are often wanting in this. According to M. LOUIS, the symptoms most to be depended upon is, a sense of suffocation, occurring sometimes periodically, but always frequently, accompanied or followed by leipothymia, and with or without blueness of the skin, and occasioned by the slightest causes. Admixture of the red and dark blood, even to a considerable extent, at least in appearance, seems not incompatible with a tolerably prolonged existence, nor with development of the intellectual faculties. It has no manifest effect upon intercurrent diseases. The existence of a communication between both sides of the heart, even when it becomes somewhat manifest, is not so dangerous as the blue disease. The former may not give rise to serious phenomena; the latter indicates that the communication is accompanied with a dangerous interruption of the circulation through the right side of the heart, or some equally dangerous lesion. As to the *treatment* of this alteration, I cannot add any thing to what I have stated in the *article* BLUE DISEASE (§ 12.).

273. VI. DISPLACEMENT AND PRETERNATURAL POSITIONS OF THE HEART. — The situation of the heart is sometimes anormal, owing to *malformation*; but my limits will not admit of an account of the various alterations of the *position*, and of the *form*, of the organ, observed as a *congenital vice*. Those who are desirous of obtaining information on this subject will find it in the works of HALLER, MECKEL, OTTO, BRESCHET, BOUILLAUD, and others, referred to at the end of this article. The *position* of the heart may be anormal in several ways, from malformation; it may be placed externally to the thoracic parietes, or internally in the abdominal cavity, below the diaphragm, or in the right side of the thorax; and the vice in situation may be associated with other anomalies, either in the circulating system, or in the position and form of the adjoining viscera, or in both. These, however, are matters calculated rather to excite curious speculation than to lead to practical inferences. But with *true displacements* of the heart, or *alterations of position after birth*, the case is different. These displacements arise from diseaes, or injury of the organ itself, or of adjoining parts; and the extent of the alteration, and the manner or mode of its occurrence, in such cases, are matters of real practical importance.

274. *a.* The apex of the heart may be turned altogether to the *left side*, without further alteration of position, or it may be raised at the same time somewhat higher in the thorax, by excessive hypertrophy of the organ. — *b.* The heart may be *pushed downwards*, by an aneurism of the arch of the aorta, or by some other tumour pressing upon it. Cases of this kind have been recorded by LANCISI, MORGAGNI, and OTTO. — *c.* True *prolapse*, or dragging down of the organ, from increased weight, and weakness of the parts supporting it, is very rare; but it has been noticed by LEIDENFROST, SENAC, ZULIANI, PACHIONI, OTTO, and TESTA. In this form of displacement, the diaphragm is carried before the heart, a convex tumour thereby invading the abdomen. — *d.* The heart may be pressed *unusually high* in the thorax, or towards the neck, by enlargement of the abdominal viscera, by large hydatid cysts, by inordinate distension of the stomach or colon, by excessive dropsical effusion into the peritoneum, by tumours of the spleen, liver, or other parts, and by aneurism of the descending aorta. Instances of these occurrences have been adduced by the writers referred to hereafter. One of the most common causes of this displacement is aneurism of the descending thoracic, or of the abdominal, aorta. In such cases, a double pulsation is felt in the aneurismal tumour, as in those recorded by Drs. GRAVES and STOKES.

275. *e.* The heart is not unfrequently *pushed over to the right side* by various alterations in adjoining viscera. It must, however, be recollected that this organ may be situated towards the right side, owing to original conformation, or to transposition of some or of the whole of the viscera. Instances of this are, however, very rare; but several have been adduced by the writers mentioned above (§ 273, 274.). The alterations causing the displacement of the heart to the right side, are, destruction or condensation of the right, and hypertrophy of the left lung, as in the case recorded by Dr. ABERCROMBIE; dropsical effusion into, or encysted dropsy of, the left thorax; pneuma-thorax of the left side; collections of pus or of blood in the left pleural cavity; tumours of various kinds; diaphragmatic herniæ; and curvatures of the spine. Dr. STOKES mentions a case in which the heart was thrust by a blow of a wheel to the right side, where it continued long afterwards to pulsate.

276. Several instances of displacement of the heart to the right thorax have been observed by me. In all

these, it arose from the effusion of fluids, of various kinds, in the left pleural cavity: in one case, from the effusion of blood from external injury, with fracture of the ribs; in three, from pleuritis of the left side, terminating in serous effusion; in two, from empyema; and in two, from pneumo-thorax. In one of these latter, consequent upon tubercles, the patient had not been long ailing. The passage of air into the left pleural cavity was sudden and rapid. I saw him within two hours from the commencement of the distress consequent upon it, and immediately detected the pulsation of the heart on the right side.

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HEPATITIS. — See Liver, Inflammation of.

HERPETIC ERUPTIONS. — Syn. *Herpes* Ἕρπης (from ἕρπειν to creep), Galen, Dioscorides; *Formica*, Avicenna. *Cytisma Herpes*, Young; *Herpes*, Sauvages, Linnæus, Willan; *Serpigo*, Auct. var. *Ecphlysis Herpes*, Good; *Dartre*, *Herpe*, Fr.; *Die Flechte*, *Zittermal*, Germ.; *Erpete*, Ital.; *Vesicular Tetter, the Serpigo*, *Fret.*

Classif. — 4. *Class.* 8. *Order* (*Cullen*). 6. *Class.* 3. *Order* (*Good*). 6. *Order.* 3. *Genus* (*Bateman*). III. Class, I. Order (*Author*, in *Preface*).

1. Defin. — *An eruption of vesicles, in distinct irregular clusters, upon inflamed bases which extend somewhat beyond the margin of each cluster; attended by tingling, concreting into lamellar scabs, and not contagious.*

2. A genus of eruptions, characterised as just stated, has been very accurately described by Willan, Bateman, Biett, and Rayer, under the name of *herpes*. This designation represents, according to the above definition, affections in many respects different from those comprised under it by Lorry, Turner, Alibert, and others; and is employed by the former writers in a more rigorous sense. Yet the several *species* enumerated by Bateman and Rayer are manifestly too numerous, some of them being merely varieties arising out of the forms which the clusters of vesicles assume, and of the situations in which they are often observed. In this opinion, I am supported by M. Biett and Dr. A. T. Thomson, who have arranged them accordingly.

3. *Herpes* is an inflammatory affection, chiefly of the vascular rete of the skin, causing the effusion of a thin fluid, which elevates the cuticle into groups of small vesicles. This affection occurs generally in circumscribed patches, the skin retaining its natural aspect in the intervals; passes through a regular course of increase, maturation, and decline; and terminates usually in from ten

to fifteen days, but is sometimes prolonged to twenty-one days. It is frequently preceded by constitutional disorder, and is sometimes critical of other diseases. The vesicles are filled at first with a colourless and clear fluid, which gradually becomes milky and opaque, and ultimately concretes into thin scabs; but occasionally a discharge of it takes place, and ulcerations follow. Tingling or pricking pains sometimes attends the eruption. In some cases, as the crusts fall off in one part, fresh vesicles arise in the vicinity, and the eruption thus creeps over a large portion of the surface and its duration is thereby prolonged. — Adopting the division of M. Biett and Dr. A. T. Thomson, I shall consider the forms of Herpes as follows: —*Species* 1. *Herpes Phlyetanodes*; — var. *a. H. Zoster*; *b. H. Circinnatus*; *c. H. Labialis*; *d. H. Præputialis*. — Species 2. *Herpes Iris.*

4. I. Description. —Spec. i. Herpes Phlyctenoides. — Charact. — *An eruption of small transparent round vesicles, in irregular agglomerated patches, preceded and attended by slight constitutional disorder.*

5. This species occasionally appears on the forehead, cheeks, and neck, but more commonly on the extremities; and is often disseminated over different parts of the body. A sensation of itchiness, tingling, or painful smarting, or pungent heat of the part about to be affected, is followed by very minute and almost imperceptible red points, clustered so as to compose an irregular-coloured patch, varying from the size of half a crown to that of the palm. After some hours, or next day, a number of hard, shining, round vesicles, the size of millet-seeds, or a little larger, arise on the inflamed patches, and are filled with a colourless, or pale citron-coloured serum, or with a brownish serum in the aged or cachectic. The vesicles are grouped in irregular clusters, of different sizes, varying from a dozen to fifty vesicles, or more. To the primary cluster or clusters, others succeed; the integuments intervening between the clusters preserving their healthy hue. The tingling and smarting are increased by heat, and by the warmth of bed. The size of the vesicles generally increases, and some acquire that of a pea, or become larger, apparently by the confluence of several into one. In about twenty-four or thirty-six hours, the fluid in the vesicles becomes milky, in the smaller, and brownish, or sanguinolent, in the larger. The whole decline or break from the sixth to the tenth day; but new clusters often continue to arise. The fluid and detached cuticle are rapidly turned into yellowish or blackish scabs, which are loosened or fall off from the tenth to the fifteenth day, or even later. The surface affected retains for some time a red or livid colour, and continues the seat of prickings or smarting. The fluid of the very minute vesicles is occasionally absorbed, and thus some of the clusters miscarry. In rare cases, the clusters have a circular form, and the areas of the groups are covered by distinct vesicles—the *Nirles*. This form is attended by severe pain, and much constitutional derangement.

6. This species of herpes is generally preceded by disorder of the digestive organs, flatulent distension or oppression at stomach; by thirst, heat, and slight febrile disturbance; and by an unhealthy state of the excretions. The constitutional disturbance is not relieved by the eruption, but often aggravated by the heat and tingling of the successive groups of vesicles. This eruption usually assumes an *acute* form, and *terminates* within three weeks, but it sometimes becomes *chronic*, one crop of vesicles succeeding another. It may appear in persons labouring under other diseases, especially of the biliary organs, and of the digestive mucous surface.

7. *A. Herpes Zoster.* — Syn. Ζωστηρ; *Zona*, Scribonius Largus, Sagar; *Herpes Zoster*, Hoffmann, Willan; *Erysipelas Zoster*, Sauvages; *Shingles.* — This variety differs from phlyctenoid herpes in the size of the vesicles, in the seat of the eruption, and in the mode in which the clusters successively appear and extend themselves. The vesicles are closely agglomerated, but distinct; they increase to the size of pearls in twenty-four hours; and are filled with a limpid transparent fluid. The inflamed bases are irregular and large, extending some distance beyond the vesicles. The most frequent seat of this variety is the trunk, particularly the abdomen and lower part of the thorax. As the patches successively appear, they extend either obliquely round the waist, or across the shoulders; or from the shoulder to the arm; or from the nates obliquely down the thighs. They very rarely advance perpendicularly. The right side is more frequently affected than the left; the eruption rarely or ever appearing on both sides at once. Of fifty-three cases, Rayer observed thirty-seven on the right side.

8. Shingles are preceded by febrile rigors, quickened pulse, headach, thirst, and disorder of the digestive organs, and of the excretions. Pains darting across the chest, scalding heat, smarting or stinging pain in the part about to be the seat of eruption, are also often present; but frequently the antecedent and attendant constitutional disturbance is but slight. The eruption consists at first of patches of shining or silvery vesicles. These usually extend, in the form of a zone; but sometimes they appear at the opposite extremities of the zone, and join by successive patches extending towards the centre. The vesicles of the individual groups reach their utmost size, which seldom exceeds that of a pea, in three or four days. The patches are then more florid, and the redness extends a few lines beyond their circumference. At the end of five or six days, the fluid of the vesicles presents an opalescent hue, becomes sero-purulent, or even purulent, if the inflammation run high. The redness of the base is now deeper, or more livid, and some of the vesicles subside; others break even before this, and, the cuticle being detached, suppurate for a few days: but the greater number dry up, and form yellowish, or brownish lamellar, or prominent, scabs, which in ten or twelve days fall off, leaving the skin red and tender. In old debilitated, or cachectic persons, the vesicles often enlarge into *bullæ*, soon break, suppurate, or even ulcerate. The greater number of the vesicular groups of zonæ arise in succession; and, while those which have first appeared are becoming purulent, or drying up, others arise in the intervals, and pursue the same course. In from ten to twenty-one days, the whole of the incrustations are detached; but, when the vesicles are very large, or confluent, and the skin much inflamed, ulceration sometimes takes place,

and the disease is much longer protracted. In some cases, the pain described above continues for a time after the eruption has healed. The febrile symptoms often subside when the eruption is completed, but these symptoms are sometimes aggravated during its progress; the deep-seated pain in the part occasionally continuing to the last.

9. *B. Herpes Circinnatus,—Ringworm, Vesicular Ringworm* — is characterised by small, round, and crowded vesicles arranged in the form of rings. It appears on the neck, cheeks, forehead, arms, shoulders, and other places, in red, oval, or circular spots, of half an inch to two inches in diameter; and is attended by itchiness and smarting. The redness is much less in the centre than towards the circumference of the smaller spots, and is entirely wanting in the areas of the larger patches. Small vesicles, whose bases are slightly inflamed, containing a transparent fluid, rapidly appear in the circumference of the patches, the areas becoming temporarily of a slight red colour. From the fourth to the sixth day of the eruption the redness declines; the vesicles become turbid, and either burst or are covered with thin brownish incrustations, which are detached between the tenth and fifteenth day, a slight desquamation at the same time taking place from the centres of the patches, when the redness had extended to them. Patches of small size often have the fluid in their vesicles absorbed, the cuticle exfoliating. The duration of this eruption does not extend above the time just specified; but it may be protracted very much longer, when the eruption of the vesicular rings is successive. In some instances the areas of the patches are covered with minute vesicles; and when this is the case, the patches spread, and extend over a considerable space. M. RAYER and Dr. A. T. THOMSON state that this eruption is is seldom accompanied by any constitutional disturbance. This, however, does not agree with my experience. The general disorder is certainly very slight, and thus escapes detection; but, in most cases, the digestive canal is more or less deranged, and the evacutions morbid.

10. *C. Herpes Labialis* — *herpes of the lips* — is similar to the varieties already described, as respects the characters and progress of the vesicles, the only differences resulting from situation. It may be seated, either in the lower, or in the upper lip, or it may extend around the mouth. It is sometimes confined to the angles. It usually appears outside of the true lips, extending to the line of union between these and the skin. Sometimes patches of the eruption also appear on the cheeks and alæ of the nose. — In three or four days, the vesicles contain a yellowish purulent fluid. The lips swell, and as the disease proceeds, become hard, sore, stiff, hot, and smarting. After the vesicles break, and crusts form, and especially if the latter are prematurely removed, the redness increases, the surface becoming harsh or cracking; and the disease is often protracted. — When it is consequent on disorder of the digestive organs, it often assumes a chronic form. — This variety is generally consequent upon a febrile state of the system and disorder of the prima via. The patient complains of headach, chills, pains in the limbs, lassitude and want of appetite for some time before the eruption appears. The alvine evacuations are usually morbid, and the abdomen often tumid or tender. Sometimes this variety is critical of catarrhal complaints, of agues, and of several acute diseases attended with pyrexia. It is occasionally preceded, or accompanied by vesicles or aphthæ in the mouth.

11. *D. Herpes Præputialis* (*Aphthæ præputii vel vulvæ* — *Ulcuscula præputii*) — is characterised by one or more groups of small, round vesicles, on the outer or inner surface of the præpuce, or on both, that usually disappear in about a fortnight. It begins in one or several patches of from four to eight lines in diameter, which are circumscribed, and of a vivid red; and rarely appears on the glans penis. The eruption of vesicles is preceded by itching and tingling of the part, which is slightly inflamed and tumid. Small vesicles arise between the second and fourth day, containing a transparent serum, which, about the fourth day becomes turbid, and afterwards puriform. On the exterior, they dry and form scabs, from the fifth to the seventh day, of a lamellar or conoid form; and, if the part be not exposed to irritation or friction the healing process proceeds underneath the scabs which are thrown off from the seventh to the tenth day. When the eruption occurs on the inner surface of the præpuce, the vesicles generally break as early as the fourth day, and the inflamed rete becomes exposed, forming a superficial sore, which has been mistaken for chancre.

12. This variety of herpes not infrequently occurs on the *labia vulvæ* of women affected with leucorrhœa, or during pregnancy and after delivery; and the eruption may be either internal, or within the labia. In these cases, the characters and progress of the vesicles, and of the consecutive sores, are the same as already described.

13. ii. HERPES IRIS. — CHARACT. *Small groups of vesicles surrounded by four concentric erythematous rings of different hues.*

14. This species was first arranged under herpes by Dr. WILLAN. It was accurately described by Dr. BATEMAN. It occurs most frequently on the back of the hands, olecranon, knees, ankles, instep, and similar parts. It commences in small red spots, consisting of concentric rings of varying shades. These spots enlarge from two to about eight lines in diameter; and, in their centres, a yellowish-white, flattened vesicle appears from the second to the third day, surrounded by several others of a smaller size, arranged in a ring. This central vesicle is surrounded by a circle of a dull brown colour, this by a second nearly of the colour of the vesicle; this second by a third circle of a deeper red; and the third, by a fourth, formed on the seventh, eighth, or ninth day. This, the most external ring, is of a rosy tint, which passes insensibly into the colour of the healthy skin. The third is the narrowest of these rings; and they may all become covered with vesicles, but the first is most frequently so covered. From the tenth to the twelfth day the fluid of the vesicles is absorbed, or it escapes and dries into scabs, which are detached two or three days afterwards.

15. II. CAUSES. — The causes of the varieties of herpes are often very obscure; and consist rather of some anterior disorder of the constitution, characterised by deranged digestion and excretion, and by vascular irritation, than of direct agents. The truth is, that they are altogether symptoms of

pre-existing disorder of the system, implicating especially the digestive, the biliary, and excreting functions. They do not depend upon contagion, and they may occur several times in the same person. They are often an advanced symptom, which frequently proves critical, of catarrhal, febrile, or inflammatory affections. — *a. Herpes Zoster* is most commonly observed in persons having delicate and irritable skins, between twelve and thirty years of age ; but it is also met with in the aged. It is most prevalent in summer and autumn ; and is generally dependent upon derangement of the biliary organs and digestive canal. — *b. Herpes Circinnatus* is common in children, especially in girls of a delicate frame, with thin irritable skins, and often depends upon the same internal disorder as the foregoing. — *c. Herpes Labialis* is often consequent upon catarrhs produced by vicissitudes of temperature ; but in its more chronic states it is usually connected with derangement of the organs of digestion. — *d. Herpes Præputialis* is frequent in middle aged men, or in those advanced in life. It sometimes accompanies stricture, or an irritable state of the urethra, or disorder about the neck of the bladder. More frequently it depends upon acrid secretions from the root of the glans. It is independent of the use of mercury ; as it is also of affections of the urethra, although often connected with these affections. It is frequently symptomatic of chronic derangement of the liver and digestive tube. It is non-contagious. — *e. Herpes Iris* is most common in children and fair delicate females. It may also be considered as dependent upon internal disorder.—All the varieties of herpes occasionally appear after unwholesome articles of food, and other errors of diet ; and after perturbations of the mind, especially when disorder of the digestive functions had previously existed.

16. III. Diagnosis. — Herpes was often confounded, by writers previous to Willan, with erysipelas, impetigo, and eczema. — *a.* It is to be distinguished from *Erysipelas*, by the numerous, small, clustering vesicles ; by the healthy surface between the clusters ; and by the absence of redness and tumefaction before the vesicles appear ; and from *Pompholyx*, by the vesicles arising in groups or patches on an inflamed base. — *b.* Neither *Eczema* nor *Impetigo* assumes the purely vesicular form, nor runs the same course, within a limited time, nor forms the dry harsh scab, which characterises herpes. — *c. Herpes Circinnatus*, when appearing on the forehead, and at the roots of the hair, may be mistaken for *Porrigo scutulata*, but the vesicular form of eruption, the regular course it pursues, and the persistence of the hair, distinguish it from this affection. — *d. Herpes Præputialis* may be confounded with *syphilitic pustules* or *ulcers*. The common chancre commences by a single pustule, whereas the herpetic affection consists of a cluster of vesicles ; the thick scabs of the former differing from the thin incrustations of the latter. When herpes is seated on the inner surface of the præpuce, and has passed into the state of excoriation, the diagnosis is more difficult. But the superficial clustering character of the sore is different from the deep ulcer of syphilis, with its hard elevated edges, and the small grey-coloured false membrane covering its bottom.

17. IV. Treatment. — *A.* This is nearly the same in all the varieties ; and should be based upon the pathological dependence of the disease insisted upon above (§ 15.) Keeping the connection of the eruption with disorder of the digestive organs closely in view, a mild ipecacuanha emetic should be exhibited, and subsequently any gentle purgative, with magnesia or an alkaline carbonate. Afterwards a free use of diluents and abstinence are all that will be required in most cases. In the more severe attacks, especially of herpes zoster, additional means will often be called for. Where there is much antecedent or attendant fever, M. Rayer advises a moderate bleeding, or the application of a number of leeches to the anus, or around the seat of eruption. Neither of these is often necessary. When the evacuations are morbid, and the biliary functions impaired, a dose of blue pill, or of calomel, at bed-time, and a mild purgative, containing an antacid, the following morning, will generally be of service. It may be even requisite to repeat these ; and afterwards, particularly when the urinary and fæcal excretions are disordered, to promote the actions of the liver and kidneys, by small doses of colchicum with magnesia or an alkaline subcarbonate. In the more painful cases of zona, these means will be found most beneficial. During the course of the complaint, the diet should be mild, chiefly farinaceous, and in small quantity. The beverages should be demulcent and cooling.

18. *B.* When herpes assumes a chronic character, owing to the successive eruption of clusters of vesicles, or to the excoriation of the inflamed skin, small doses of blue pill, or of the hydrargyrum cum creta, and mild stomachic aperients, are the most appropriate means. In addition to these, the decoction of sarsa, or of the elm-bark, with liquor potassæ, are often very serviceable. In *herpes labialis*, and *herpes præputialis*, these remedies are especially required. In more obstinate cases, particularly when the excretions continue disordered, mild stomachic purgatives, and alteratives, should be persisted in ; and warm or tepid bathing, or even vapour baths, occasionally employed. In *herpes iris*, the warm bath, and minute doses of the arsenical solution with the liquor posassæ, are generally of service. Dr. A. T. Thomson, recommends, for this species, the decoction of the Rumex obtusifolius with these alteratives.

19. *C.* When herpes occurs in cachectic or aged persons, not only should great attention be paid to the state of the excretions, all fæcal and morbid accumulations being duly evacuated ; but the digestive and assimilating functions ought to be promoted, by exhibiting gentle tonics, with the alkaline carbonates. If the eruption ulcerate, the application of nitrate of silver, in substance, or in a strong solution, will promote cicatrisation. If there appear a disposition to slough, the preparations of bark, &c. will be required. When violent sub-cutaneous pains accompany zona, hyoscyamus or other narcotics may be given with the medicines already recommended ; but the warm or vapour bath, and colchicum, as above prescribed (§ 17.), will be found the most successful. In *herpes præputialis* and *herpes vulvæ*, the early application of nitrate of silver will often shorten the duration of the eruption. Where there are much heat and stinging of the parts, a wash containing the subborate of soda, or the

sulphate of zinc, or of alumina, will often be useful. These may also be prescribed in herpes circinnatus; but in all cases the chief attention must be directed to the removal of disorder in the digestive and biliary organs, and to the regimen of the patient.

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HICCUP. — Syn. Λὺγξ, λυγυὸς, Hippocrates. *Singultus*, Pliny, Sauvages, Vogel, Sagar. *Lygmus*, Swediaur. *Pneusis singultus*, Young. *Clonus singultus*, Good. *Hoquet*, Fr. *Glucksen*, *Schlucken*, Germ. *Singhiozzo*, Ital. *Hiccough*, *hocket*, *hickup*.

Classif. — 4. *Class*, 3. *Order* (*Good*). II. Class, III. Order (*Author*).

1. Defin. — *An uneasy sensation at the præcordia followed by a rapid contraction of the diaphragm, of momentary duration, causing an audible inspiration, iterated at short intervals.*

2. i. *Description.* Although hiccup is frequently symptomatic of dangerous maladies, and is even a fatal sign in these, yet it is occasionally the chief and primary disorder. When it is thus idiopathic it is generally a slight and evanescent affection. It consists of a sudden and rapid contraction of the respiratory muscles, of the diaphragm especially, instantly followed by relaxation, thereby causing as rapid an inspiration, which is audible from its suddenness and force. These convulsive movements return at short intervals, and are attended by painful uneasiness at the præcordia and epigastrium, increasing with the frequency of the convulsive contractions and continuance of the disease.

3. ii. *Causes.* — Hiccup occurs frequently in infants and young children. It is not uncommon in aged persons: and, at these epochs, is generally symptomatic of irritation of the stomach or duodenum, or produced by a too precipitate deglutition, the movements which accomplish this process often taking place in an irritable or spastic manner, in persons at the two extremes of existence. The arrest of the alimentary bolus in the œsophagus; an insufficiently masticated or dry state of the bolus; an irregular or precipitate performance of deglutition, especially, when the stomach is empty or debilitated; the ingestion of highly seasoned or stimulating food or drink, or of cold fluids; laughter, particularly in hysterical females; long fasting and emptiness of the stomach; irritating or poisonous substances in this organ; worms in the digestive canal; and wearing strait-laced corsets, are the most common exciting causes of the less important and idiopathic cases of this affection.

4. Hiccup may be one of the forms in which hysteria manifests itself, particularly when hysterical patients have been subjected to mental emotions, as after crying or laughing. It may also follow a fit of cough or vomiting; or it may be produced by sudden frights. But in all these, debility, especially of the digestive organs, is a predisposing cause. It is often a symptom of irritation or inflammation of an adjoining viscus, particularly of the convex surface of the liver, and of the stomach, especially at its cardiac orifice. It may arise from the passage of biliary calculi along the ducts, or from calculi in the kidneys or in their passage into the ureters. Strangulation of internal parts, irritating matters in the colon, external injuries and fractures of the ribs, the various stages of pregnancy, and the suppression of accustomed discharges and eruptions, have severally produced it. Besides, singultus occurs in a great number of acute diseases and fevers, particularly towards the close of life. It usually attends fatal cases of inflammation of the abdominal viscera, and is generally present when hepatitis of the upper or posterior parts of the liver extends to the diaphragmatic peritoneum, or when abscess of this organ points upon the diaphragm.

5. When singultus occurs after a too full meal, or after the ingestion of cold or irritating fluids, which is very common, it is comparatively of little import, further than that it evinces a debilitated state of the stomach and increased irritability. But when it follows a meal either frequently or habitually, chronic inflammation of the stomach, especially about the cardiac orifice, or even of the œsophagus or duodenum, should be suspected; or irritation of the pancreas or biliary ducts, or worms in the alimentary canal may exist. When depending upon this latter cause, it sometimes alternates with sneezing and pruritus of the nostrils.

6. Authors have recorded numerous instances of hiccup continuing from two to three days to many months, or even longer, in some cases without any other very prominent symptom of disease; in others, alternating with sneezing, syncope, or hysteria. Various anomalous cases of this affection have been recorded by Poterius, Schenck,

Bartholin, Alberti, Lanzoni, Hoffmann, Bauer, Parr, and others. Most of these have arisen from some permanent source of irritation, as biliary or urinary calculi; or have been one of the many manifestations of hysteria. The only instances of persistent hiccup that I have observed, were referable to these sources, or to uterine irritation.

7. iii. The *lesions of structure* most frequently observed in those who have experienced this affection in a remarkable manner, have been chiefly the following: — The usual appearances and results of inflammation of the peritoneum pleura, diaphragm, liver, stomach, or other adjoining viscera; encysted or other tumours connected with, or pressing upon, the diaphragm or its crura; scirrhus of the cardiac orifice of the stomach, or of the pancreas; morbid structures developed about the root of the mesentery; calculi, and abscesses in the kidneys, or calculi in the gall ducts; tumours pressing upon the eighth pair of nerves; and albuminous or other fluids effused into the sacs of the pleura, or into the peritoneum.

8. iv. Of the *diagnosis and prognosis* of singultus it is unnecessary to make any specific mention. The former is obvious: the latter may be inferred from what has been already stated. When hiccup is the primary disorder, and quite independent of internal inflammations, or of fever, a favourable result will generally follow, although it may be more than usually severe or frequent in its attacks. But when it is a symptom of these maladies, and appears at a far-advanced stage of acute or chronic diseases, it is generally a fatal indication. Cases, however, will occur in which the experience and pathological discrimination of the practitioner will be severely tried in giving an opinion as to the result.

9. v. *Treatment.* The means of cure in this complaint should be selected with strict reference to the causes and pathological dependency of it. — *A.* In the *primary* or *idiopathic* forms of it, the administration of *opium* with *ether*, or of other *anodynes* and diffusible *stimulants*, and of refreshing alkaline beverages, will generally give relief. Various *antispasmodics*, volatile nervines, and sedatives, especially *camphor*, *ammonia*, *hyoscyamus*, *hydrocyanic acid*, either taken into the stomach, or inhaled into the lungs with warm vapour, will often remove the complaint. Idopathic hiccup also may cease spontaneously; or it may be arrested by exciting some powerful mental emotion, as surprize, fright, &c., or by powerfully exciting the diaphragm by *sternutatories* or *emetics;* or by taking any substance in quantity into the stomach. When its continuance or severity requires medical interference, the pathological knowledge and diagnostic acumen of the physician are often put to the test, as either the absence of other symptoms, or their equivocal nature, renders it doubtful to what cause it should be assigned. In those cases, the chest and abdomen ought to be minutely examined before any opinion is formed.

10. In obscure or doubtful cases, *camphor*, with or without the *nitrate of potash;* the *spiritus ætheris nitrici*, or the *spiritus ætheris sulphurici comp.*, or the *tinctura camphoræ composita* may be given with *demulcents*. The alkaline *sub-carbonates* may also be exhibited with *hyoscyamus*, or with *colchicum*, *opium;* or the *hydrocyanic acid* may be given in an aromatic or gently tonic infusion. If there be reason to refer the affection to irritation in the kidneys, or in the biliary ducts, demulcents with camphor, and the *sub-carbonates of soda, &c.*, will generally be of service. If it appear to depend upon worms, the treatment should be directed accordingly. When it is referrible to inflammatory action in the stomach, or duodenum, full doses of *calomel* with opium and small quantities of camphor, general or local depletions according to circumstances, and cathartic enemata, are chiefly to be depended upon. Even in the more obscure, and non-febrile cases, which may resist soothing and antispasmodic remedies, *cupping* over the hypochondria, or along the vertebral column, as recommended by J. P. Frank, followed by *blisters*, *sinapisms*, *moxas*, the warm *turpentine epithem*, or other counter-irritants, in the same situation, may be prescribed. In cases where vascular depletion seems inadmissible, advantage may be derived from *dry-cupping*, as advised by Riedlin, Cleghorn, and Hufeland. Besides these, the tincture of *nux vomica* has been employed by Ranoë; and the *cajeput oil*, by Vogel.

11. When this affection is merely a form of *hysteria*, or is connected with uterine irritation, *cold aspersions* of the surface; *refrigerants* with camphor, and the other means usually employed in that complaint are indicated. When it assumes a periodic character the *sulphate of quinine*, and other preparations of bark may be prescribed, with sulphuric acid, and sulphuric æther. Repeated doses of *magnesia* with *ammonia* and *aromatics;* the carbonates of *iron*, and other preparations of this metal; the sub-nitrate of *bismuth;* the various preparations of *zinc;* and lastly, *electricity* or galvanism in the direction of the spine or diaphragm, have severally been recommended.

12. When hiccup is a distressing symptom about the fatal termination of disease, large doses of camphor, of ammonia, or of musk, and opiate frictions, &c., have generally been prescribed; but these can only palliate, and very frequently they are inadequate to accomplish this intention.

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HOOPING-COUGH. — Synon. *Pertussis*, Sydenham, Huxham, Cullen, Darwin. *Tussis Ferina*, Hoffmann. *Tussis Convulsiva*, Sauvages. *Tussis Quinta*, Schenck. *Tussis Clangosa*, Bourdelin. *Tussis Delassans, T. suffocans, T. Amphimerina, T. Tussiculosa, T. Stomachalis, T. Spasmodica*, Auct. var. *Pneusis Pertussis*, Young. *Bex convulsiva*, Good. *Bronchitis Epidemica*, Marcus. *Bronchitis Convulsiva*, Prunel. *Bronchocephalitis*, Desruelles. *Coqueluche, Maladie Cuculaire, Toux Quinteuse*, Fr. *Keichhusten, Kikhusten, Krampfhusten*, Germ. *Kikhosta*, Swed. *Pertosse*, Ital. *Whooping-cough, Chin-cough, Kin-cough, Kinkhost.*

CLASSIF. — 2. *Class*. 3. *Order* (Cullen). 2. *Class* 2. Order (*Good*). II. CLASS, III. ORDER (*Author*, in *Preface*).

1. DEFIN. — *Convulsive and suffocative cough, accompanied with a reiterated hoop, or consisting of many successive short expirations followed by one deep and loud inspiration, and these, alternating for several times; occurring in paroxysms, ending with the expectoration of tough phlegm, and frequently with vomiting; infectious and often epidemic; appearing but once during life.*

2. M. GUERSENT defines hooping-cough to be a catarrhal affection of the air-passages, characterised by sonorous inspirations with imminent suffocation. The origin of this disease is obscure; for, if the ancients have at all observed it, they have not described it so as to enable us to recognise it. Doubtless new maladies may develop themselves in the progress of the refinements of society, and of the changes which the physical and moral world have undergone during a lapse of ages. This cannot be denied in respect of some of the exanthemata, or of diseases propagated by a specific virus, as smallpox. But, excepting these, it is difficult to admit, that those maladies the spread of which very much depends upon atmospheric vicissitudes, and epidemic constitutions, and upon general susceptibility of the species, can have been of modern occurrence entirely. It is not easy to conceive why a disease should not have at least occasionally appeared; since the circumstances favouring, and causes inducing, it must have been in existence from the earliest ages. It may be said of hooping-cough, as of some other diseases, that, although the more exact observations and descriptions of modern observers have made it known only in comparatively recent periods, yet it may have existed nevertheless, and have been unknown from having been confounded with other maladies resembling it.

3. The passages in HIPPOCRATES that may be referred to this disease, are equally applicable to several other catarrhal affections, or disorders of the respiratory organs. Some of the older writers take notice of epidemics, which have been considered to have been hooping-cough, especially those of 1239 and 1311. But they may have been severe catarrhal epidemics, or influenza. ROSEN thinks, that pertussis passed from the East Indies and Africa into Europe; but of this he has furnished no satisfactory proof. According to MEZERAY, it first appeared in France in 1414; and he has been generally considered as having given the earliest account or description of the disease. But, upon referring to this writer (*Abrégé Chron. ou Extrait de l'Hist. de France*, t. iv. p. 65.) there is nothing but the name *Coqueluche* that is applicable to it. Indeed his account would have been quite applicable to the influenza of January, 1837. The epidemics noticed by DE THOU, and PASQUIER, to which the same name was given, and which occurred in 1510, and 1557, were evidently influenza, and not hooping-cough; and the same remark is applicable to most of the supposed epidemics of this latter disease, during the sixteenth and seventeenth centuries.

4. WILLIS was the first who accurately described hooping-cough under the name of "Tussis puerorum convulsiva, seu suffocativa, et nostro idiomate *chincough* vulgo dicta." (*Opera omnia*, Amst. 1682. vol. ii. p. 169.), and it is only from his time that we have any account of the disease that can be relied upon. It was afterwards noticed by SYDENHAM, (*Op. Universa*. Lugd. Bat. 1726. p. 311.), and by both it was treated of as a common disease. It is extremely doubtful that the epidemics of the 15th and 16th centuries, which proved so very fatal were actually this complaint. The imperfect notices made of them convey nothing really proving that they were it. ROSEN confesses, that he cannot determine when pertussis first appeared in Sweden; and, as respects this country, there is no account earlier than that of WILLIS which can be received.

5. I. DESCRIPTION. — Hooping-cough, whether in an epidemic or sporadic form, presents nearly the same phenomena, particularly when it is simple or uncomplicated. But it is modified in many respects by the season, climate, constitution or habit of body of the patient, and by the complications which take place in its early stages. I shall, therefore, describe, first, its simple or uncomplicated form, and, secondly, the complications which it frequently presents.

6. i. SIMPLE HOOPING-COUGH. — Pertussis has been divided into two stages by some writers, viz., the *catarrhal* and the *convulsive*; and into three by others, the second stage being divided by the latter into the periods of convulsion, and of decline. *A*. The *stage of development*, or the catarrhal period, is generally announced by some slight rigors or chills, turgescence of the face, slight redness of the conjunctiva, watering of the eyes, and the signs of simple coryza. There is scarcely any fever, sometimes only, for twenty-four or thirty-six hours; but, in some cases, the fever is more marked, and it occasionally assumes a quotidian or tertian type. The cough is more or less frequent, comes on in fits, and may at this time be taken for common catarrh, or catarrhal affection of the trachea and bronchi. However, a slight shade of difference may be detected in the tone of the voice, which experienced observers will recognise as characteristic of the disease. The cough is more sonorous, and more acute than in bronchitis; expectoration is scanty, even with adults, and the matter brought up is limpid, as at the commencement of catarrhal affections. The anterior part of the neck is sometimes uneasy, or even painful, but in other respects there is little complaint, excepting a slight depression of spirits, moroseness, heaviness, diminished appetite, and sluggish bowels. This period generally continues from five to twelve days, and seldom more than fifteen.

7. *B*. *In the Convulsive, Spasmodic, or Nervous Stage*, the patients complain frequently of uneasiness or pain under the sternum; the fits of cough are longer, more frequent, particularly at night, and commence with unpleasant titilation at the larynx, during which the expiratory and inspiratory movements are irregular and incomplete, chiefly in very young children, who evince considerable dread of the attack. This state is attended with anxiety and a slight mucous rattle. On the accession of the fit, infants grasp persons or objects that are near them, or upon awakening from sleep start up. Each accession consists of a very dry, sonorous, spasmodic cough; the contractions of the respiratory muscles, being so quick, and succeeding each other so rapidly,

and attended with so much constriction of the larynx, that the patient cannot breathe and seems almost suffocated. The face and neck are swollen, injected, and violet-coloured; the jugular veins are gorged; the eyes prominent, injected, and watering; and the paroxysm terminates with one or two long incomplete inspirations, attended with that peculiar noise from which the disease has generally derived its designation. Sometimes the fit of cough is interrupted during one or several minutes, and is resumed; but does not cease entirely until the patient rejects, by a sort of regurgitation, a ropy and limpid fluid, which comes partly from the bronchi, and partly from the stomach, as shown by the presence of portions of ingesta, and of bronchial mucus. In some cases, when vomiting does not accompany the paroxysm, this particular fluid proceeds chiefly from the air-passages; in others, particularly in those accompanied with vomiting, it is chiefly from the stomach. It is sometimes sanguineous, either in streaks or specks; and when the paroxyms are severe, blood sometimes escapes from the nostrils, and even, in rare cases, from the ears and eyelids. The termination of the paroxysms is often attended by a watery secretion from the eyes. Crying, mental irritation, or opposition, frequently bring on a fit; and even the sight of another in the paroxysm, will induce it in those affected by the disease. The fits are generally much more severe after a meal, or after running, or other very active exercise. Their number varies with the severity of the disease, from five or six in the twenty-four hours, to one every ten or fifteen minutes; they are generally severer, and more frequent during the night than in the day. On applying the stethoscope or the ear to the chest, on the accession of the paroxysms, a mucous rattle may sometimes be heard; but frequently no unnatural noise can be detected, unless the disease is complicated with bronchitis. During the paroxysm the respiration is so far suspended as not to be heard in any part of the lungs; but at the moment of inspiration, the air is precipitated by a loud hissing sound, as far as the bifurcation of the bronchi, where it seems to encounter some obstacle, as it does not pass further for one or two seconds. This stage usually continues from fifteen days to a month, or even longer. During its course, the fever, which had been either scarcely perceptible or but slight, but had been suspended after the invasion of the disease, is, in some cases, rekindled with more force, assuming the continued or intermitting type. It is chiefly during the early part of this stage that pertussis becomes complicated with, or excites, bronchitis or other disease of the lungs. Yet such complications occur at various intervals from the attack, and sometimes even accompany the first stage. But it is generally during this period that affections of the head, or of the abdominal viscera, supervene, which, with lesions of the lungs, occasion unfavourable terminations. However, when the disease is slight and uncomplicated, it is without fever, the patients preserving their usual health and appetite, which may be even more craving than usual.

8. *C.* The *Stage of Decline* is of indeterminate duration, occurring from three to five weeks after the invasion of the disease, and continuing from twelve days to two or three months. It may be said to commence from the time of the paroxysms being more distant and shorter than in the preceding period, and by their termination, in the excretion of an opaque and thickish matter, as in the last stages of catarrh, and in the vomiting of alimentary matters. The fits become insensibly feebler during this stage; the cough gradually loses the characteristic whoop, and approximates nearer that attending the last stages of catarrhal affections. Sometimes the patient will remain for a day or two, or even longer, without cough; but on exposure to cold, change of temperature or weather, or after errors of diet, it returns with similar characters. In some seasons especially, as during autumn, and at other seasons on the occurrence of easterly winds, I have seen the paroxysms of cough return, with the same characters after a fortnight, a month, or even two or three months, of perfect and apparent recovery.

9.ii. COMPLICATED PERTUSSIS.—Hooping-cough is frequently accompanied with, or occasions, in its severer forms, or in predisposed subjects, most serious affections. It may even attack patients already suffering or convalescent from disease; and although occurring under such unfavourable circumstances, may not be severe and may terminate favourably, although in other cases it will often aggravate the pre-existing or accompanying malady — so much so as even to lead to a fatal termination. The complications of hooping-cough vary extremely, according to the season of the year, the state of the weather and atmospherical vicissitudes, the character of the prevailing epidemic, and the habit and temperament of the patient. They constitute the most important features of the disease, inasmuch as the danger depends entirely upon the particular form of complication present. The success, also, of the practitioner will mainly depend on the celerity and accuracy with which he may detect existing or incipient states of superadded or contingent disease, and the decision with which he may treat them. The importance of attending closely to the progress of whooping-cough, even in apparently favourable cases, must be apparent to those who have had occasion to observe how insidiously diseases of the substance of the lungs, or of the brain, have supervened and advanced even to an irremediable degree, masked by the cough, so as to have failed of attracting the attention of parents or those around the patient — or, if they have attracted notice, to have been mistaken for a symptom merely of the simple and less dangerous affection. I have frequently been called to children dangerously affected with disease of the lungs or brain, which had been in existence for many days before attention had been excited by it. Considering the complications of pertussis most important, I shall treat of them somewhat in detail.

10. Pertussis, in either an epidemic or sporadic form, particularly the former, sometimes follows rapidly upon measles. Occasionally it appears during convalescence from that complaint. In such cases disease of the lungs, particularly bronchitis, pneumonia, pleurisy, tubercles, &c., often steals on without being suspected until it has made a formidable progress, or passed beyond the reach of aid. The previous disease, and the treatment employed for it, has often induced that state of the system which does not evince the complication by many of the usual symptoms which characterise it, in the idiopathic or primary form; and it is chiefly by attentive observation of

the pulse and respiration, in the intervals between the paroxysms, and of the expectorated matter, and by examining the state of the lungs by means of percussion and the stethoscope, that we can detect the complication or judge of its nature and extent. In infants with a narrow, or malformed chest, there are often great dyspnœa, frequency of pulse and of respiration, sometimes even without much serious disease of the lungs, beyond slight bronchial irritation. The most common complications of hooping-cough, especially from two or three months old to seven or eight years or later, are *croup, bronchitis, pneumonia, pleurisy, pneumothorax, œdema of the lungs, hydro-thorax.* In all these the respiration is difficult, frequent, and embarrassed; the countenance and extremities are turgid; and there is continued frequency of pulse. The expectoration terminating the paroxysms, varies according as either of the above lesions is present. It is generally much diminished, and, in proportion to the severity of the organic disease and of the accompanying fever. But the extent and nature of the complication should be carefully determined by the stethoscope and by percussion. In somewhat older children, and in those advancing nearer to puberty, who are of a scrofulous habit, and hereditarily disposed to phthisis, hæmoptysis, sometimes to a considerable extent, takes place, and in these subjects particularly, tubercular disease of the lungs is not infrequently developed, either with or without hæmoptoe.

11. *B.* In infants and young children, the *functions of the brain,* and the symptoms, indicating disturbance of this organ, should be carefully watched for, particularly those indicating *cerebral congestion, hydrocephalus, meningitis,* or *cerebritis;* and if any of these symptoms occur, and especially if attended by continued fever, by screaming, or by rolling of the head, or convulsions indicating meningitis, or hydrocephalus; or by somnolency, falling of the eyelids, cool state of skin, inability or disinclination to move or be moved, with dilated pupil, &c. indicating cerebritis, decisive treatment should be adopted, as recommended for these maladies.

12. *C. Diseases of the Abdominal Viscera* are much more rarely complicated with hooping-cough than those already mentioned; however *diarrhœa,* chronic *irritation of the stomach and bowels, remittent fever, inflammation of the mucous surface* of these organs, are not infrequent attendants upon it. Sometimes, even, *inflammation of the peritoneum* and *mesentery* will occur, during the advanced stages of hooping-cough, and I have occasionally also met with inflammation of the cæcum and colon, and *pericarditis.* These complications, particularly those of the digestive mucous surface, may superinduce others, as enlargement of the mesenteric glands, and affections of the cerebral organs, rapidly terminating in effusion.

13. With respect to all these complications, it may be generally remarked, that they are attended by more or less fever of a continued or remittent type, and with paroxysms of cough, more or less dry and severe. Sometimes the febrile exacerbations and remissions are well marked, especially when the complication is in the abdominal cavity. The expectoration terminating the fits generally diminishes as the complication increases in severity, and the vomitings often disappear. The paroxysms also are followed by more sensible prostration of strength. — Having thus taken a general view of complicated pertussis, I shall next more particularly notice those complications which most commonly occur, and which frequently superinduce further disease especially in connected or associated structures.

14. *D. Pertussis associated with Bronchitis* is extremely frequent during spring and winter, and in this climate, especially in the months of February, March, and April, owing to the prevalence of easterly winds at that season. 1. It may precede hoopingcough; 2. It may be coeval with it; and, 3. It may supervene in the course of the disease. The last is most common. Whenever bronchitis appears, there are always decidedly febrile symptoms during the intervals between the paroxysms of cough. The breathing is also much accelerated, and when examined by auscultation is accompanied by the mucous rattle, and occasional temporary suspension of the respiratory sound in parts of the lungs, owing to the accumulation of the mucous secretion for a while in one or more of the bronchial tubes conveying air to those parts of the organ. The expectoration also from being clear, whitish, and ropy, becomes more opaque, less fluid, gelatinous, and less abundant. The paroxysms of cough are much more frequent, and often accompanied with a feeling of oppression in the chest, and are less constantly followed, or even not at all, by rejection of the contents of the stomach. The chest sounds well upon percussion, and the patient lies on the side most affected, or in slighter cases on either side. When the bronchi of both lungs are generally affected, he is unable to lie on either side, or is incapable of lying down at all.

15. This complication often terminates fatally, either from obstruction of the air-tubes by the accumulation of tenacious mucus, together with spasm about the larynx, occasioned by the nervous character of the disease, and the irritation of the glutinous secretion, the patient dying asphyxied; or from congestion of the vessels of the head, owing to the paroxysms of cough, the obstruction produced by the mucus in the air-passages, and the difficult circulation through the lungs; or from the inflammatory action having extended to the trachea and larynx, or to the minute bronchi and substance of the lungs, terminating in condensation, &c. of the structure of the organ, &c. In some cases, owing to the treatment employed and constitution of the patient, the acute form of the bronchial affection gradually subsides until it arrives at a milder state; when, owing to the incapability of the vessels to assume the healthy state, a chronic form of disease continues long afterwards, which may be removed, in some cases, by judicious management; but which terminates in ulceration of the mucous membrane, or gives rise to tubercles, to chronic pleuritis, or other lesions in the thoracic cavity. This complication is frequent from six or seven months upwards, and especially during the second, third, and fourth years of age.

16. *E. Hooping-cough associated with pneumonia and pleuritis,* is very frequent in the spring during easterly or northerly winds, particularly when these follow heavy falls of rain and open weather. It is more common in some epidemics than in others, and is met with at all ages, but most frequently from one to six or seven years or upwards;

and in children of a full habit of body, sanguine temperament, and strumous diathesis, it may be nearly coeval with the pertussis; but it more commonly supervenes in the course of the disease, the inflammation commencing often as bronchitis and extending in parts along the smaller ramifications of the bronchi, to the air-cells and substance of the lungs. In some cases, *pleuritis* supervenes to the pneumonia, and in others a portion or a whole lobe of the organ, and the pleura covering it, seem as simultaneously affected. It is very difficult to ascertain the existence of this complication in infants and very young children, but auscultation and percussion furnish considerable aid to the diagnosis.

17. The *Symptoms* of this complication vary according as the inflammation of the lungs and hoopingcough are coeval affections, or as the one may supervene to the other. When the affection of the lungs or pleura is present from the commencement, the cough occurs frequently, in short paroxysms, and is seldom followed by the rejection of the contents of the stomach. The pulse and respiration are quick, hard, full, and hurried; the alæ nasi and diaphragm labour much during the respiratory motions, and the cough is without the attendant hoop, and does not terminate in vomiting, as the complication becomes developed. When it has been consequent upon the bronchial complication, wheezing, and difficult expectoration are generally present; and the sputa become thick, opaque, glutinous, puriform, or streaked with blood. The prostration of strength is also great. There is a dull sound given out upon percussion of the thorax, over the seat of the disease. On examining the chest with the stethoscope, the signs enumerated in the pneumonia of children are more or less manifest (see art. Lungs—*Inflammation of*).—When the *pleura* is implicated the cough is more suppressed, and pain is complained of in some part or other of the thorax; yet this latter symptom is not always prominent. In addition to the other stethoscopic signs, the metallic trickling is often present. In the worst cases of this complication, as in those of the preceding, the lips assume a livid hue, and the extremities become cold, or even of a leaden colour. This complication often terminates unfavourably in a short time. During its continuance, the hooping-cough presents characters much less distinct, but which become more pronounced as the inflammation is subdued.

18. *F. Complications with tubercular Phythisis, hydro-thorax,* or *pneumo-thorax*, are rarely or never met with, unless as the consequences of one or other of the foregoing, or in the far-advanced stages of pertussis; and are, therefore, unfavourable terminations, rather than complications, of the disease, arising out of neglect or inappropriate treatment, or constitutional predisposition. The state of the expectoration and hectic symptoms, and the signs furnished by auscultation and percussion, will enable the practitioner to detect either of these terminations.

19. *G. Pertussis associated with inflammatory irritation of the Membranes or Substance of the brain, or occasioning Hydrocephalus*, is very common, particularly in infants, about the period of dentition, or from six months to two or three years of age. In these, convulsions in various forms, spasm of the glottis, screaming, &c., are of frequent occurrence, and indicative of this complication, which is often more prevalent in some epidemics than in others. Congestion of the brain, owing to interruptions to the return of blood from it, during the paroxysms of this disease, often terminates in effusion, capillary reaction, or even softening of parts of the organ. The spasms and convulsions which generally attend these affections of the brain in infants and young children, rarely carry off the patient. They are rather the indications of that state of disease of the substance or membranes of the brain, which terminates in softening of the central parts, and in serous effusion into the ventricles. Whenever the paroxysm of cough is increased in violence, the characteristic hoop disappearing, the face becoming very livid, and the thumbs drawn into the palms, cerebral congestion, with its attendants and consequences, should be anticipated. In some cases, but by no means frequently, the swelling on the tops of the fingers and toes, noticed by Dr. Kellie, and the crowing inspirations indicating spasm of the larynx (see Larynx) and threatening suffocation, are observed, generally at early stages of this complication. When the convulsions affect one side of the body more than the other, and especially if one side or limb be paralysed, softening of some of the more central parts of the brain and serous effusion may be inferred.

20. In all cases of pertussis, when chills, followed by burning heat of the surface; pains of the head, with obscure redness of the conjunctiva; a fixed, brilliant, dry, and peculiar appearance of the eye; unusual redness or pallor of the face; very torpid bowels with morbid excretions; irritability of stomach independently of the fits of cough; aversion from light or noise; heaviness or drowsiness and languor; grinding of the teeth; or sudden starting or shocks of the body in sleep; rolling or tossing back the head, and piercing screams; are observed, then irritation of the brain or its membranes, which will soon pass into organic change and effusion, is manifestly present, whether there be convulsions or not. When stupor or unconsciousness has come on, with one arm waving in the air, or tossed over the head, whilst the other is paralysed, a farther advanced state of disease than mere inflammatory irritation, as softening or effusion, may be inferred.

21. *H. Pertussis associated with Disorder of the Bowels, or with infantile remittent Fever*, is not infrequently observed. In these cases the abdomen is tumid, the evacuations offensive and unnatural, the breath is fœtid, the tongue loaded, and the appetite is impaired. The complexion is lost, and the eyes more sunk and heavy than in health. At last febrile exacerbations and remissions are observed generally twice in the twenty-four hours; pickings of the nostrils and lips; the cough returns more frequently and ceases to terminate in vomiting; the breathing is oppressed, hurried, and short; the expectoration, at the termination of the fits, is more scanty, but without the signs of bronchitis or of pneumonia; and emaciation proceeds. If this state of disorder continue, effusion in the ventricles of the brain may take place, or the mesenteric glands may become diseased. This complication steals on imperceptibly, and generally in the second or third stage of pertussis.

22. iii. *The Appearances observed in fatal Cases of Pertussis* show the nature and extent of the complications, rather than of the disease itself. The accounts furnished us of the fatal epidemics in former ages, contain no details of the appearances after death; and even the more recent researches of Watt, Marcus, Waterton, Guibert, Desruelles, Guersent, and others have thrown little light upon the nature of the malady, although they have illustrated the changes which often supervene in its course. The lesions which are most constantly observed, are more or less redness of the mucous surface of the trachea and bronchi, with considerable tumefaction of the glands at the bifurcation of the latter. These tubes contain a considerable quantity of a ropy or more or less thick mucus. In the bronchitic complication these changes are still more marked, and in infants the thymus gland is often unusually large. Inflammations of the lungs, or of the pleura, or of both, in all their phases and stages; and effusions into the pleural cavities, with or without adhesions or false membranes, are not unusual, but are observed only in cases of the pulmonary complications described above. They are generally associated with muco-puriform matter accumulated in the bronchi, and splenification or condensation of several lobules or portions of the lungs.

23. When the disease induces chronic bronchitis or tubercular consumption, whether hæmoptœ has occurred or not, the mucous membrane of the bronchi has been found thickened, softened, rarely ulcerated in some points and injected, and tubercles have been observed in all stages of development and softening, and accompanied with ulcerated excavations. Tubercular changes are, however, not very common in young children. Dilatation of the bronchi is sometimes observed; but I have not met with it so often as Laennec believes it to occur. It is to be looked upon as a remote consequence of the disease in prolonged cases. M. Breschet observed, in two instances, injection of the pneumo-gastric nerves: but Marcus, Guersent, and myself have not found these nerves materially changed.

24. The morbid appearances found within the cranium have been chiefly consequent upon the cerebral complications, and have consisted of softening of the central parts of the cerebrum; effusion into the ventricles, or between and beneath the membranes; congestion of the vessels, &c. As far as my dissections have gone, inflammatory appearances have been observed in the medulla oblongata, or in its membranes, even when no other remarkable lesion was present within the cranium. Whether this change be a consequence of the disease or not, is difficult to determine; but there can be little doubt that those found in the brain are merely remotely consecutive lesions.

25. The stomach usually presents no particular lesion; but I have observed inflammatory appearances in the œsophagus, and the same have been remarked by Ozanam in his numerous dissections in the Foundling Hospital at Milan. I have likewise found the mucous surface of the pharynx and epiglottis, particularly the latter, more or less inflamed, and the subjacent cellular tissue, especially at the base of the epiglottis, infiltrated and œdematous. The mucous membrane of the intestines, particularly of the cæcum and colon, has been in some instances ulcerated, and the mesenteric glands engorged; but only in protracted cases passing into infantile remittent fever. From the numerous post mortem examinations I have made, I am warranted in stating that most of the lesions observed by writers in this disease are merely effects of the complications of, and diseases excited by, this complaint; and that the parts most constantly found altered, are the mucous covering of the epiglottis, trachea, and bronchi; and of the pharynx and œsophagus; and, as respects the nervous system, the medulla oblongata and its membranes.

26. iv. *Of the Nature and Seat of Pertussis.*— Sydenham imputed hooping-cough to the presence of a subtile and irritating vapour in the blood, affecting the lungs and exciting the paroxysms. Boehme (*Cur-Methode der Wichtigsten, Brust krankeiten*, Leip. 1788), conceived that it proceeded from a peculiar miasma acting chiefly on the nerves. Linnæus had previously referred it to the presence of minute insects in the air (*Dissert. Exanthemata Viva.* Upsal, 1757); an opinion which was partially adopted by Rosenstein, who, however, believed that it was propagated by a morbific principle emanating from the affected, and passing into the system of those exposed to its influence by the respiratory organs and stomach; and hence the affection of those viscera, and the irritation of the mucous glands, occasioning an inordinate secretion of *phlegm*.

27. Waldschmidt (*Institut. Medicinæ Rationalis*, 12mo. Marb. 1688), Stoll (*Ratio Medendi*, pars ii. p. 180.) Danz (*Versuch einer Allgemeinen Geschichte des Keichhustens, &c.* Marb. 1791), Lentin (*Memorabilia*, p. 38), Friborg and Brouzet (*Sur l'Education des Enfans*, t. ii. p. 25), ascribed the disease chiefly to gastric disorder and saburra, whilst they admitted, particularly Danz and Lentin, that the lungs are also much affected, but in a sympathetic manner, and that the other symptomatic disorders accompanying it vary exceedingly, whilst the respiratory functions are more constantly disturbed. Chambon (*Des Maladies des Enfans*, t. ii. 8vo. Paris, 1799), and Tourtelle (*Élémens de Méd. Théorique et Pratique*, t. ii.), considered pertussis as a species of catarrh. The former located it in the stomach, and supposed that it is of an asthenic nature, the cough and other nervous symptoms being occasioned by the affection of this organ. The latter extended the gastric disorder to the lungs, and regarded the disease as a pituitous pneumo-gastric affection. A similar opinion was entertained also by Dr. Styx (Hufeland, *Journ. d. Pr. Arzneyk.* b. vii. st. iv. p. 177). Gardien (*Traité des Mal. des Enfans*, p. 391.) nearly coincided with Tourtelle in referring it to a nervous irritation, *sui generis*, causing a pituitous or increased mucous secretion from the bronchi and stomach with convulsive action of the glottis and diaphragm, and believed that it differs from catarrh chiefly in its cause and the periodicity of its character. The opinion of Millot was not materially different from the foregoing. He referred the disease to a spasmodic irritation of the stomach primarily, and of the lungs symptomatically, and he imputed the cough chiefly to the convulsive action of the diaphragm; but he contended that the throat and bronchi are also implicated. M. Broussais has also argued that the source of the disease is in the stomach; but he considers that it

consists of inflammatory irritation, producing an increased secretion of mucus, and that the termination of the fits in vomiting disembarrasses the affected surfaces and assuages for a time the irritation. He, however, admits that this affection of the stomach is not of itself sufficient to constitute the disease, but that it is always extended to the bronchi. (*Ann. de la Méd. Physiol. Mai*, 1824.)

28. Besides those who have thus considered pertussis either catarrhal in its nature, or allied to this state, others have conceived that it is chiefly of a nervous character. Whilst the former have placed the most stress upon the catarrhal symptoms, particularly the discharge of a clear ropy mucus, and the acceleration of the pulse in many cases,—the latter have been more engaged with the convulsive features of the disease, especially the cough, its occurrence in fits, as in other nervous affections; and with the perfect, or nearly perfect, state of the functions during the intervals in the simple form of the disease.— The opinions of HOFFMANN (*Opera*. Suppl. ii. pars x. p. 244.) and of HUFELAND (*Bemerk. ueber Blattern, &c.* p. 421.), in this very nearly coincide. They both impute hooping-cough to irritation of the nerves supplying the larynx, air-passages, diaphragm and stomach; to an affection chiefly of the pneumo-gastic nerves. HUFELAND supposes that the irritation of the nerves supplying the larynx and air-passages is extended to the diaphragm by the intimate sympathy existing between these parts; that this muscle is thereby thrown into convulsive action; and that, owing to its action on the cardia, and the irritation extending to the stomach through the medium of the eighth pair of nerves, this organ undergoes energetic contraction, and evacuates its contents; the vomiting thus occasioned removing the irritation of the respiratory organs, and thereby terminating the paroxysm. Thus, the vomiting is the antagonist of the spasmodic state of the organs of respiration; and, as observed in practice, a salutary occurrence. Very nearly allied to this opinion is that proposed by JAHN (*Ueber den Keichhusten*. Rudolstadt, 1808.) He considers hooping-cough to be an affection of the phrenic nerves, occasioned by a peculiar miasm too subtle to be recognised. LOBENSTEIN-LÖBEL (*Ueber die Ang. Membr. den Keichhusten, &c.* 1811.), contends, that this disease originates in a peculiar affection of the nerves of the diaphragm; that, in its second stage, the phrenic nerves are in a state of irritation; and that, in its third, the irritation is expanded throughout the system; it thus commencing with a morbid affection of the diaphragm, which extends itself by nervous connection to the rest of the respiratory apparatus and stomach, and sympathetically to the whole economy.

28.* According to PALDAME (*Der Stikhausten*. Halle, 1805.), hooping disease depends on exalted irritability of the lungs, and of the organs most closely sympathising with them, particularly the diaphragm and stomach. Nearly allied with the foregoing opinions, is that which has been proposed by WENDT (*Die Kinderkrankh. System. &c.* 8vo. Breslaw, 1822.). He arranges hooping-cough with nervous diseases; argues against the production of a secretion peculiar to it, yet imputes it to a certain miasm engendered by the nature of the season and constitution of the atmosphere, and thus prevailing generally in an epidemic form. The nerves which he considers chiefly affected, are the branches of the intercostals, the eighth pair, and the recurrent nerve; the solar plexus he views as being consecutively affected. He contends, that the disease is not a variety of bronchitis, as believed by many; and that the bronchi are only sympathetically irritated, and chiefly from the increased secretion of mucus and aqueous fluid poured into them during the paroxysm. He admits that it is generally accompanied with a phlogistic diathesis of the bronchi and substance of the lungs, but that there is no developed state of inflammation; this diathesis admitting, however, of inflammation being speedily kindled up from exposure to its exciting causes, and during certain epidemics; but when it exists, that it is merely a contingent complication.

29. M. GUIBERT (*Recherches Nouv. sur le Croup et sur la Coqueluche*. Paris, 1824.) views pertussis as essentially nervous. He considers that a common cough may pass into this affection, by having the spasmodic state of the muscles of the larynx and of the diaphragm superadded to it; and, therefore, that spasm superadded to cough constitutes the disease,—the state of spasm resulting from the high nervous susceptibility and particular disposition to it existing in children, and from individual idiosyncrasy. He supposes that, whilst the spasmodic state constituting the disease affects the muscles of the larynx and the diaphragm, in some cases this state is extended to the muscles of the head and whole body, occasioning general convulsions. The increased secretion of mucus he refers to an excited state of the mucous membrane of the air-passages, and of the pharynx, œsophagus, and stomach, existing independently of any inflammatory action; and considers that the paroxysms of cough proceed from obstruction of the bronchi by the accumulation of this secretion; the nervous symptoms being the result of the spasm, which he considers the chief agent of the morbid phenomena. But this theory leaves unexplained the precise cause and origin of the spasm, which, doubtless, affects the parts to which he refers it.

30. According to M. GUERSENT (*Dict. de Méd.* t. vi. p. 6.), hooping-cough is a catarrhal affection seated in the trachea and bronchi, consisting of a specific inflammation, accompanied with spasm of the trachea and glottis. To this opinion it may be objected, that the causes of the disease are not always of a specific character; that, although it evidently is often propagated by infection, yet it frequently occurs sporadically, and then it cannot be traced to any specific cause. When, also, inflammatory appearances are observed in the air-passages of some cases, which have terminated fatally, these differ not materially from the changes occasioned by common inflammation.

31. Dr. WATT (*Treatise on the History, Nature, and Treatment of Chincough*. Glasg. 1812.) considers the disease to be inflammatory, and seated in the bronchi. Dr. BADHAM, and MARCUS, of Bamberg, entertain the same view as Dr. WATT. ALBERS, of Bremen, denies hooping-cough to be essentially inflammatory. He justly states, that it is never so rapidly developed as bronchitis; that it is an affection of the nerves of the chest,

frequently occurring epidemically, and generally admitting of cure without the assistance of art, unless when appearing in a complicated state, or when inflammatory action supervenes in its progress, — a termination which would but seldom occur if it were essentially inflammatory, and which seldom is observed to follow bronchitis or pneumonia when left entirely to nature. Thus, whilst Albers considers hooping-cough to be an affection of the nerves of the thorax, with which bronchitis is frequently complicated, Watt and Marcus conceive that it is a catarrhal bronchitis from its commencement. Nearly similar to the opinion of these two authors, seems to be that of M. Fourcade-Prunet, who views it as a variety of bronchitis, without, however, stating in what the difference consists. The convulsive paroxysms of cough he attributes to the morbid sensibility of the mucous membrane of the air-passages in their inflamed state, and to the irritation occasioned by the respired air and the secretion formed on this membrane. M. Boisseau (*Dict. abrégé des Scien. Médicales*, t. v.) entertains a similar opinion to that of M. Fourcade-Prunet; and Dr. Dewees (*A Treatise on the Physical and Medical Management of Children*, 8vo. Phil. 1825.) contends that it is a catarrhal inflammation of the respiratory mucous membrane, with an augmented secretion of mucus. Dr. Dawson (*Nosol. Pract. of Physic*. 8vo. Lond. 1824.) also believes in the inflammatory nature of the disease; but confines its primary seat to the mucous membrane of the glottis. Laennec regards it as a variety of pulmonary catarrh, holding an intermediate grade between the pituitous and the mucous catarrh; and he denominates it, from the convulsive character of the cough, convulsive catarrh. The expectoration he considers to be at the commencement pituitous, and towards its close nearly mucous. The absence of respiratory sounds during the paroxysms, he explains, by supposing either a momentary congestion from blood or serum, giving rise to a tumefaction of the mucous membrane sufficient to obstruct the bronchi, or to a spasmodic constriction of these tubes.

32. Dr. Webster (*Med. and Phys. Journ.* Dec. 1822.) contends, that the symptoms, when closely viewed, warrant the conviction that hooping-cough depends upon inflammatory irritation of the brain, or of its membranes, or of both. A somewhat similar opinion had been given by A. Leroy (*Méd. Maternelle*, 8vo. Paris, 1803.), Boisseau, Otto (*Nye Hygæa*, Aug. 1824.), and Begin (*Traité de Therapeutique, &c.* t. ii. 8vo. Paris, 1825.), have admitted the frequency of the association of cerebral affection with hooping-cough, even from the commencement; whilst they oppose the inference that the latter is dependent upon the former. Dr. Webster is, however, the first writer who fully appreciated the influence of cerebral irritation on the respiratory organs in this disease, and excited attention to an important and early complication of it.

33. M. Desruelles states, that hooping-cough is an inflammation of the bronchi, giving rise, at an early period of its course, to cerebral irritation; that, as long as the bronchitis is simple, the cough is not attended by the characteristic hoop; but that, when the cerebral irritation commences, the diaphragm and muscles of the larynx, &c. become subject to convulsive actions, which impress the cough with its peculiar features. The arguments already adduced against the inflammatory origin of the disease, are equally applicable to this view; and the constant existence of cerebral irritation is by no means proved — the occasional supervention of this irritation being all that is fully ascertained.

34. From my researches into the pathology and treatment of hooping-cough, during some years previously to 1823, I was led to consider the medulla oblongata or its membranes very early implicated in this disease; evidences of inflammatory irritation of these parts having been very generally observed in the *post mortem* inspections I had made. I conceived that the morbid impression or irritation occasioned by the exciting cause in the upper parts of the respiratory surfaces, particularly the glottis and its vicinity, affects the respiratory nerves, especially the pneumagastric; and that the irritation is extended to the origins of these nerves, where it aggravates and perpetuates the primary affection. Where no predisposing, concurrent, or consecutive causes or influences favourable to the developement of inflammatory action either in the respiratory organs or in the brain exist, the morbid action does not proceed beyond an irritative state, and the disease preserves a simple form. But when such causes are in operation, the irritation passes into inflammatory action in either of these situations; in some cases extending from the epiglottis and pharynx to the bronchi and lungs, and in others from the medulla oblongata to the brain or its membranes. As the irritation increases or extends downwards along the respiratory surfaces on the one hand, or to the pharynx and gastric mucous surface on the other, and as it predominates in the one above the other, so does the disease assume more of a bronchitic or of a gastric character; the latter form being the most favourable, as tending to disembarrass the bronchi, and to prevent the extension of disease in that direction. When the disorder implicates the lungs, the gastric affection either does not appear, or is thereby superseded; and when the brain becomes affected, either the gastric symptoms are not observed, or they assume different characters, appearing in the intervals between the fits of cough, instead of terminating the fits, and the cough loses its convulsive or nervous form. It does not, however, follow that the stomach is materially affected, even when the vomiting is the most remarkable. In these cases, the irritation seldom extends much beyond the pharynx; the irritation of this part and of the epiglottis, and the convulsive nature of the cough, being the principal causes of the vomiting. The copious discharge of ropy mucus, terminating the fit, partly proceeds from the pharynx and vicinity, even when there is no vomiting. Attentive observation subsequently to the adoption of these views, and extensive experience of the treatment founded on them, have confirmed my confidence in their accuracy, in the principal points.

35. I believe that the disease is chiefly nervous, in the simple cases; that it preserves this character more or less throughout, even when inflammatory complications ensue; and that, in the uncomplicated state, the nervous affection never proceeds beyond irritation. The impression made by the causes, is followed by functional

lesion of the respiratory nerves, particularly the nervus vagus; and, owing to this lesion, the mucous surfaces they supply frequently experience consecutive changes, as respects the state of circulation, exhalation, and secretion. Hence result increased vascular determination and augmented secretion, attended by irritation of the glottis, epiglottis, pharynx, and air-tubes, inducing convulsive action; which supervenes the more readily, as the disease is essentially nervous in its nature, but often becoming, consecutively, irritative, or inflammatory; this last characteristic being only an occasional complication, occurring from predisposition, habit of body, epidemic influence, or fortuitous causes favourable to its developement. — The inflammatory appearances in the medulla oblongata and base of the brain may be owing to the functional relation of these parts to the respiratory order of nerves, which receive the first impression of disease, and whose functions are so manifestly disordered throughout, as noticed above (§ 7.); or these, as well as the consecutive cerebral complications, may be induced by the disposition to disordered circulation, occasioned by the change in the state of nervous influence, and perhaps still more by the impeded return of blood from the brain during the paroxysms.—The vomiting so generally terminating the fit has been, as I have shown, imputed by many primarily to the stomach. But this symptom is often attendant upon severe fits of cough, whenever the epiglottis suffers unusual irritation. As it does not occur during the first days of the complaint, it seems to be owing to irritation of this part, which has been gradually coming on with the progress of the disease, until it reaches a pitch occasioning increased convulsive action of the respiratory muscles, extending to the diaphragm, the abdominal muscles, and stomach; the irritation of the morbidly sensible epiglottis by the cough increasing the paroxysm, until vomiting is produced.

36. II. DIAGNOSIS. — The existence of this complaint, particularly at an early stage, is not always readily ascertained. During the first period, it is not easily distinguished from a common cold. In most instances, however, the more paroxysmal nature of the cough, and the absence of fever, will indicate the affection, although the characteristic hoop is wanting. Occasionally this sign is absent altogether, in the slightest cases, although the disease is prevalent in a family; and yet there may be little doubt of the nature of the cough. Its more or less convulsive form, the perfect intervals, the evidence of congestion towards the head during the fit, and, as the complaint advances, the copious discharge of ropy mucus, are quite distinctive, although there is no complete hoop. When this latter sign is present, or when the paroxysms of cough terminate in vomiting, there can be no doubt as to the disease.

37. III. PROGNOSIS. — When the complaint is simple, the prognosis is favourable. But it may, at first, assume this form, and afterwards become complicated, and consequently more or less dangerous, owing to injudicious management, to various influences, and to its continuance; therefore a cautious or reserved opinion should be given as to the result in all the early stages. The complaint is, generally speaking, more dangerous, the younger the child; but the period of dentition aggravates the risk. When, however, the infant has a healthy nurse, and is itself of a good constitution, — if it have not recently suffered from any infantile complaint, or been lately weaned — if the attack commences in summer or spring, or in a mild dry season — if the intervals be complete, and of considerable duration — and if the paroxysms be attended by vomiting and a free excretion of mucus,— a favourable prognosis may be entertained. If the lungs or the head — the latter especially — betray disorder, — if the child belong to consumptive, scrofulous, or old asthmatic parents — if there be tendency to cerebral diseases in the family, — a cautious or an unfavourable opinion should be given. All the symptoms indicative of the more serious complications (§ 10,11.), are signs of danger. Upon the whole, the complaint is more favourable in adults than in infants, or even than in children; yet there is great risk, even in them, of the occurrence of pneumonia, bronchitis, or pleuritis; and, in young adults, of a scrofulous diathesis, of phthisis, or of hæmoptysis. It may cause abortion in pregnant females; and, in those who are hysterical, the cough may ultimately pass into an obstinate form of that complaint, and be removed with difficulty, especially if the circumstance be overlooked. The occurrence of the complaint during convalescence from measles or scarlatina is unfavourable, inasmuch as bronchitis and the other pulmonary complications are apt to ensue. — The presence of cerebral symptoms, or of fever or a quick respiration in the intervals, and a scanty excretion of mucus after the fits, indicate danger.

38. IV. CAUSES, &c.—*Of the causes and modes of propagation of hooping-cough* we have no very positive knowledge. The disease occurs either epidemically or sporadically, and often during seasons, and under circumstances, wherein catarrhal and pulmonary affections prevail. When it commences in autumn or winter, it is always of longer duration than at other seasons; and, like other catarrhal complaints, it is often prevalent in spring and summer. It generally affects several or many at the same time; particularly infants from two or three weeks old and upwards, and children till after the second dentition. It sometimes occurs in adults, and but rarely in the aged. Among adults, females are oftener attacked than males; those of the latter who are nervous, irritable, or approach the nearest to the female constitution, being the most susceptible of it. It affects persons only once; but rare instances of second attacks have been observed.

39. Hooping-cough, independently of its epidemical appearance, seems to possess infectious properties, which, although admitted by the majority of authors, have been disputed by a few. It is always quickly propagated through a family, and its extension, when sporadic, may be prevented by removing the unaffected children. Mothers, nurses, and even fathers, who have not had the disease, will often contract it from their children; and I have known mothers, who had had it in their childhood, affected a second time by a child at the breast, or by its prevalence amongst the other children. Its infectious properties are further shown, by a child having caught it from others, at school or at nurse, and, when removed under the

disease to a distant part of the country, and into a family where it did not exist, communicating it readily to those who had not had it. Like all infectious maladies, it is much more rapidly propagated during certain constitutions of the air, particularly those in which catarrhal complaints are frequent, or when measles prevail, than in others. In its epidemic form, its infectious property appears to be most fully marked, from the circumstance, probably, of the concurring causes, whatever they are, being then more active, as well as from the predisposition these epidemic states occasion. Pertussis has also been frequently observed to follow, epidemically, upon epidemic morbilli. When it occurs sporadically, and during healthy states of the atmosphere, it often fails to be propagated, unless to those most predisposed. Moreover, it is often necessary to infection that the breath of the affected subject should be inspired by the unaffected; and that the disease should, at the time, be fully developed. The infectious property seems to diminish as the disease declines. Dr. Cullen and many others believed that it disappeared in from four to six weeks; but, as Dr. Elliotson remarks, the period cannot be fixed with any precision. It is generally from five to seven or nine days, or even longer, after exposure to infection, that the cough commences.

40. V. Treatment. — There are few maladies against which a greater array and variety of means, both medicinal and regimenal, have been recommended, than against hooping-cough. Vascular depletion, emetics, purgatives, diaphoretics, antispasmodics, excitants, internal and external irritants, &c., have been severally prescribed as unfailing agents, and combined, in infinite forms, in the treatment of this complaint. Although these may be extremely beneficial, they may be also most mischievous; success entirely depending upon their application appropriately to the peculiarities of individual cases. As the disease is variously modified and complicated, so it cannot be removed by a particular class of remedies, or by a specific form of treatment. Means inappropriately employed, may convert a simple and slight case into one both complicated and dangerous. — There are certain considerations requisite to a successful treatment of this complaint; and these should always be kept in view, not only in it, but also in all other epidemic maladies. I refer especially to the constitution and habit of body of the patient, to the character of the prevailing epidemic, to the nature of existing complications, and to the period and progress of the disease. It is owing to these circumstances, that the means which are beneficial in one case, or in one season, are often injurious in others. Thus the epidemics of spring or winter more frequently require vascular depletion, than those of summer and autumn, whilst these latter derive more benefit from emetics than the former. So important are the complications of pertussis, that the treatment should be mainly directed to their prevention or removal; and whatever they may be — whether bronchitis, pneumonia, congestion or inflammation of the brain, &c. — it should be recollected that they are much more dangerous, than when occurring primarily or in a state of previous health, unattended by the aggravating circumstances of this complaint.

41. i. *Treatment of Simple Hooping-cough.* — In the slighter cases, little more is required than attention to diet, regimen, and the excretions, unless the child be plethoric, when additional means will be necessary. — *a.* In the *first stage*, a dose of *rhubarb* with *hydrarg. cum creta* or *calomel*, and a little *ipecacuanha*, may be given every night, occasionally interposing an *emetic*. The *diet* should be farinaceous, with milk. The child ought to be confined to a mild, equable temperature, and wear flannel next the skin, in winter, spring, or autumn. If the patient be plethoric, it will be proper, as a precaution, to apply *leeches*, according to his age, either behind the ears or over the sternum, as the head, or respiratory organs, may indicate a disposition to be affected. In the more severe attacks, also, this measure should never be neglected; and *diaphoretics*, with small doses of *antimony*, or of *ipecacuanha*, ought to be given every four or five hours; the secretions and excretions being duly promoted by calomel and rhubarb every night, and a stomachic *purgative*, or an emetic, each second or third morning, according to circumstances.

42. *b.* In the *second stage* of simple pertussis, an *anodyne* may be added to the diaphoretic mixture, and taken every four hours. If no sign of cerebral or pulmonary affection appear, the *hydrarg. cum creta* may be substituted for calomel, in the night-powder. It is in this period, that the treatment recommended by Dr. Pearson is most serviceable. This consists of an antimonial *emetic*, followed by a draught containing a drop of tincture of *opium*, five drops of *ipecacuanha* wine, and two grains of *carbonate of soda*, for a child of one or two years of age. This draught is to be repeated every four or five hours for several days; the bowels being kept open by rhubarb and calomel. As the cough declines, he lessens the opiate, and gives *myrrh* in place of the ipecacuanha wine. This treatment is excellent for children of three or four years of age or upwards: but until they reach two or three years, opium ought not to be given. For those of the age mentioned by Dr. Pearson, I consider the extract or syrup of *poppy*, or *conium*, or *henbane*, to be preferable. The *liquor potassæ*, also, will be often advantageously substituted for the soda. The *decoctum senegæ*, or the *infusum valerianæ* may be given in this and the next stage with some aromatic water, and an antispasmodic. It will be sometimes of service, even in this stage, to exhibit an *emetic*, if the fits do not terminate in vomiting; and, unless the attack is slight, the same *diet* and *regimen*, as directed in the first stage, should be continued in this. A principal indication in both is to watch the first sign of visceral disease, and to oppose its accession by leeches applied in either of the situations just named, and by emetics. In both periods, also, advantage will accrue from the warm semicupium or pediluvium at bed-time; but, unless the case become severe, it will only be occasionally required. — The excretions should always be promoted by mild and stomachic purgatives.

43. *c.* In the *third stage*, the chief indications are to strengthen the system, and to supersede the convulsive character of the affection, by giving *tonics* with *antispasmodics* and *anodynes*. The gentler tonics may be first employed, and successively those which are more energetic, in conjunction with preparations of *poppy*, or with

paregoric, or with *conium, hyoscyanus, laurel water*, &c. There are numerous medicines belonging to these classes that may be given with great advantage in this stage, but they will be noticed hereafter.—*Tonics*, as well as antispasmodics or anodynes, will be advantageously exhibited with the *alkaline subcarbonates*, or with *liquor potassæ*, or BRANDISH's alkaline solution; and *purgatives* beneficially conjoined with vegetable bitters or other tonics. If the disease assume a periodic or intermittent type, the preparations of *bark* or *quinine* should be prescribed.—It is principally in this stage, that *change of air* proves so serviceable. It should not be neglected, particularly when this period and convalescence are protracted. In both this and the preceding stage, *embrocations* or *liniments* of a rubefacient and antispasmodic kind (see *Append.* F. 295, *et seq.*), applied to, or rubbed upon, the spine, will prove very serviceable.—*Sinapisms* will also sometimes be of use, especially in threatened bronchitis; and, in young, delicate, or irritable children, are preferable to blisters and the tartarised antimonial ointment, from which I have seen dangerous consequences accrue in patients of this description.

44. ii. *Complicated Hooping-cough.* — *A.* The most common complication is with *inflammation of the bronchial mucous membrane.* But this may not be the only associated inflammation; for *pneumonia*, or *pleuritis*, or even both, may be superadded to it, — a contingency to which the practitioner should be always alive. If *simple bronchitis* (§ 6.) be alone present, *local depletions*, in addition to the treatment already directed, must be prescribed; and *antimonial wine*, with the solution of the acetate of ammonia and camphor julap, should be taken every third or fourth hour. In young children, however, ipecacuanha wine should be preferred to antimony. A small dose of calomel, with or without ipecacuanha, rhubarb, or jalap, may be given every night, or night and morning, according to circumstances; guarding, however, against too great an action on the bowels. After depletions have been sufficiently employed, *sinapisms* or *blisters* applied for a few hours, or until erubescence of the surface is produced, and then followed by warm poultices, will be very serviceable. The warm *semicupium* may also be resorted to at bed-time. An ipecacuanha *emetic*, when expectoration is difficult, or twice or thrice a week, will also be beneficial. After the inflammatory symptoms are removed, any of the *anodynes* recommended above may be added to the diaphoretic mixture, an *embrocation* or *liniment* (F. 297. 300. 311.) applied along the spine, and the complaint treated, in the *second* and *third stages* especially, as advised for the simple disease.

45. *B.* In the complication with *pneumonia* or *pleuritis*, or with both (§ 14—18.), more decided *depletion* will generally be requisite, than in the bronchitic form. But it must not be overlooked, that these inflammations are seldom present in pertussis without more or less bronchitis. In this, as in the other pulmonic complications, *cupping* over the sternum, or between the shoulders, is a preferable mode of depletion to the application of leeches; and, in a far advanced stage of these inflammations, either after blood has been freely abstracted, or when excessive secretion into, or accumulation of viscid fluid in, the bronchi threatens suffocation, *dry cupping* between the shoulders is the next efficient means to a stimulating emetic. A purplish hue of the lips or cheeks, and dilatations of the nostrils, should not prevent depletion, if it is otherwise indicated, particularly in plethoric children, if it have not already been practised, and if the skin be hot and the pulse not much reduced in strength. When the substance of the lungs, or pleura, becomes inflamed, *calomel*, with or without ipecacuanha, should be given in larger and more frequent doses, than when the bronchi only are implicated, and the diaphoretic mixture should contain an antimonial preparation. This last, however, ought to be given with caution in infants or young children, for I have seen most serious effects produced in them by large doses of tartarised antimony, particularly when too often exhibited, or too long persisted in. In this complication, *sinapisms* and *blisters* prescribed as above (§ 16.) are beneficial after vascular depletion has been pushed sufficiently far; but, in many cases, much greater benefit will accrue from the application of the *warm turpentine epithem* on the chest or between the shoulders, or from one of the *liniments* (F.297. 300. 311.) already noticed, employed in the form of an embrocation.—Having removed the existing complication, the subsequent treatment must entirely depend upon the peculiarities of the case. The *diet* and *regimen* should be strictly enforced, and the patient kept in a mild and equable temperature. The semicupium, or warm bath, gentle *diaphoretics* with *diuretics* and anodynes, and, as the disease declines, mild *tonics* with *sedatives* and *antispasmodics*, will also be of great service. The excretions should be kept free, and change of air advised as soon as it can be safely attempted.

46. *C. The complication with cerebral affection* must be promptly met by the application of *leeches* behind the ears or to the occiput, or by *cupping* in this situation or on the nape, according to the age of the patient and the severity of the complication. Whenever the simple form of pertussis has presented such severity as to render the occurrence of pulmonic or cerebral affection at all probable, and more especially if the child have been plethoric, I have always directed *leeches* to be applied behind the ears or to the occiput, influenced by the views as to the pathology of the complaint already stated; and I have had the greatest reason to strongly recommend this practice. When hooping-cough is aggravated by *teething*, the cerebral complication should be dreaded, although neither *convulsions*, nor any other very prominent symptom of it, may have appeared. In these cases, the gums ought to be attentively examined, and scarified as they may require it. If the infant be at the breast, the nurse's milk and health should receive attention. The secretions and excretions of the patient must be most actively promoted by full doses of *calomel* with *James's powder*, by *purgatives*, and cathartic enemata. The temperature of the head should be reduced by the *cold affusion* on it, or by cold-sponging whenever either becomes necessary, and the means advised for *Inflammations of the* BRAIN (§ 191.), and for *Acute Hydrocephalus* (see DROPSY *of the Head*, § 260.), ought to be employed according to the circumstances insisted upon at these places. The objects are to remove incipient mischief, and to

prevent thereby the accession of a formidable malady, by a prompt application of efficient means. To wait until the coming evil has fully declared itself, is to sacrifice the principal chances of success; for all cerebral affections that supervene during pertussis are much more dangerous than those which occur primarily. As soon as the complicated affection is removed, change of air should be recommended. Nothing is so advantageous as a complete change of air for children treated in London, or in other large towns.

47. *D. Infantile remittent fever* generally does not appear in connection with pertussis until an advanced stage of the latter. Other associated affections, as *chronic pulmonary disease, curvatures of the spine, rickets, affections of the joints, enlargement of the mesenteric or of the absorbent glands, &c.*, are sometimes also met with in protracted cases of hooping-cough, or in the stage of decline, particularly when the disease has been neglected, or when the morbid affection has been perpetuated by habit, or by the neglect of such means as are calculated to break the chain of disordered action. They often also may be traced to constitutional vice or predisposition, and to neglect of the excreting functions. Under whatever circumstance, either these or the remittent fever may occur in the advanced course of hooping-cough, debility is a principal element of the complicated malady. The functions of digestion and respiration, and consequently assimilation and nutrition, having been more or less impaired during the early stage of the primary disease, inherent vice, or an existing disposition to disorder, the more readily manifests itself. As constitutional power sinks, maladies, which most commonly arise from debility, make their appearance; the particular malady being determined in its occurrence by hereditary taint, or by previous disorder. In many cases, the superinduced affection is merely a sequela of pertussis; but in others, the characteristic symptoms of the primary disorder still continue in a very pertinacious manner.

48. The remittent febrile disorder depends, in several instances, upon chronic irritation of the digestive mucous surface; in others, upon the state of the season or weather, and the influence of exhalations from a humid soil, or upon a moist and cold atmosphere; and in some, upon both conjoined. But whatever may be the source, it cannot be doubted, that debility is an important part of the disorder, and that the alvine secretions and excretions are much disordered. At the same time, therefore, that a treatment appropriate to the affection of the digestive canal is requisite, the state of constitutional power must receive attention. *Purgatives* are generally necessary in this complication, especially at an early period of it; but they ought to be of a stomachic kind, or combined with *tonics*, and neither be too irritating, nor too pertinaciously directed. The compound infusions of gentian and of senna, with sulphate of potash; rhubarb with this latter, in an aromatic water; hydrargyrum cum creta, or blue pill, with ipecacuanha, at bedtime — either of the preceding, or castor oil, being taken in the morning; are amongst the most suitable purgatives; and they should be repeated according to the state of the stools. If the bowels be irritable, or dysenteric, a full dose of calomel or hydrarg. cum creta, with the compound ipecacuanha powder, should be first given, having in some cases premised an ipecacuanha emetic. Some hours afterwards, a dose of castor oil ought to be taken, and its operation promoted by an emollient injection. After the intestinal canal is evacuated, irritation should be allayed by mild tonics, conjoined with aromatics, absorbents, sedatives, or antispasmodics, according to the peculiarities of the case. Preparations of cinchona, quinine, chalybeates, &c. will subsequently be of service. The decoction of bark, or any tonic infusion, will be advantageously given with liquor potassæ, or Brandish's alkaline solution; and afterwards the ammonio-chloride or potassio-tartrate of iron, and change of air, will generally prove most beneficial.

49. Although this treatment is recommended, chiefly with the view of preventing hooping-cough from lapsing into, or becoming associated with, infantile remittent, and of removing this complication, yet it will be equally serviceable in the prevention of the other *sequelæ* of the complaint mentioned above (§ 47.). When *affections of the joints, rickets,* or *mesenteric disorder* either supervene upon, or follow, an advanced stage of pertussis, the preparations of *iodine*, and other means directed for these complaints, should be resorted to. *Affections of the spine* are generally owing to weakness of the muscles and ligaments of the vertebral column, induced by this disease; or to scrofulous inflammation of some portion of the column itself. When the disorder is attributable chiefly to the former of these causes, then the *tonics* already recommended, *salt water bathing, sea air,* and *frictions* with stimulating liniments along the spine, will be very serviceable; and when the more solid structure of the column is implicated, then the preparations of iodine, Brandish's alkaline solution, or the *liquor potassæ*, and change of air, should be severally prescribed, as circumstances will suggest.

50. iii. *Of the more Specific Modes of Treatment advised for Hooping-Cough, and the Circumstances in which they are admissible or appropriate.* — Willis and Sydenham directed *bloodletting* in the plethoric and inflammatory cases, *emetics* of the oxymel of squills, *purgatives*, and *blisters* to the nape of the neck or between the shoulders. Willis also prescribed *tonics* during the decline of the complaint. He particularly notices the *Muscus pyxidatus*, or *M. Pyxioides*, the *Lichen pyxidatus* of Tournefort, or cup-moss, as a very popular remedy in hooping-cough. Gerarde remarks that "the powder of this mosse, given for certaine daies together, is a most certaine remedy for that perillous malady the chin-cough." Dilenius praised the powder of it, when frequently given; and supported his opinion by the authority of Willis and Gerarde. Other writers have prescribed it in the form of decoction in milk. Van Woensel (*Hist. de la Soc. Roy. de la Méd.* t. ii. p. 294.) recommended it in decoction, sweetened with syrup of mint. Baglivi employed also the *Muscus arboreus* and *M. querneus* in pertussis, in the form of decoction; and a syrup prepared from the decoction exists in the *Pharmacopœia Wittembergensis*, to facilitate its exhibition to children. Stoll (*Rat. Med.* vol. vi. p. 6.) found these mosses or lichens, particularly that growing on the oak, very serviceable in the hooping-cough which was epidemic in Vienna in the spring of 1775; Frank also praises it.

51. De Haen, in a letter written in 1747 to Van Swieten, describes a very prevalent and fatal epidemic hooping-cough. Children from a few weeks to ten years of age were chiefly affected, but adults were occasionally also seized. When one child was attacked in a family, none escaped who had not had the disease previously. It was often protracted to three, four, or even six months. He states that vascular depletion in the plethoric, purgatives, ipecacuanha, anodyne emulsions, opiates, oxymel of squills, nitre, &c. were severally employed, but with no marked success. He subsequently, with his colleagues, Ouwens, Westerhoff, and Velsen, was induced to prescribe the *Kermes mineral*, by the benefit derived from it in spasmodic asthma. To a child of six months, he commenced with one grain in the 24 hours, given in sugar and divided into three powders,—to a child of one year, two grains, in the same period,—and to a child of three years, three grains, increasing the dose gradually and cautiously. The success of this medicine he describes as most astonishing. In another letter similarly addressed, in 1751, De Haen remarks that, although he had found the *Kermes mineral* of very great service in the hooping-cough of that autumn, it was less so than in the epidemic of 1747: and he adds—"Plerique vero curantur *Limacum*[*] lacte coctarum largo atque protracto usu." (A. De Haen, *Opusc. quæd. inedita, &c. Cur.* J. Eyerel, P. i. Vind. 1795, p. 42. 173.) In another work (*Rat. Med.* t. iv. p. 121.) he notices a case in which the fit of cough terminated in suffocation: but the means usually resorted to in suspended animation having been employed, restoration and recovery took place.

52. Stoll states that he never saw sporadic cases of pertussis in Vienna up to the year 1777. The disease had previously appeared only in epidemic forms, and generally with modified characters. At some seasons the stomach, at others the head, and sometimes the lungs, were especially deranged. Occasionally it was attended by a miliary, and in some instances by a scarlet, eruption. In a few cases urticaria and erysipelas occurred. In Vienna and Hungary, it generally evinced a stomachic origin.—The epidemic of 1775 frequently affected adults. The paroxysms were most severe on alternate days, and during the night; and peripneumonia was a frequent complication. He states, that bloodletting, emetics, purgatives, emollients, and opiates, especially this last, were prescribed without benefit. Blistering, however, between the shoulders, and bleeding, were beneficial when the disease was about to pass into pneumonia. He observed the injurious effects of stimulating expectorants in favouring the developement of pneumonia, with which pertussis is so apt to become complicated.—Tonics were generally required, as early as debility became apparent; and, even after the disease was removed, they were often necessary. When the bowels were not freely open, they were conjoined with aperients.—In the epidemic of 1779, all the cases in which the fits terminated in vomiting recovered. Stoll found ammonia, gum ammoniacum, and Venetian soap, given in simple oxymel, or oxymel of squills, of service. Decoctions of emollient herbs and roots, and of the flowers of arnica, were also beneficial. Opiates were productive of mischief in many cases, and even of fatal effects in some, a glutinous effusion having been found in the bronchi of such cases.—During the epidemic in Copenhagen in 1784, Bang made trial of the *cicuta*, after the exhibition of *emetics*; but with temporary advantage only. Towards the decline of the disease, *musk* was found of service.

53. Dr. Huxham introduced the use of *mercurial purges*. After their operation he prescribed the *Peruvian bark*. Dr. Bisset commenced the treatment with an *emetic* of oxymel of squills, followed by rhubarb, manna, &c. As soon as the severity of the complaint began to subside, and the intervals between the fits to be prolonged, he gave the bark.—The propriety of having recourse to *emetics* was advocated by Hoffmann, Forbes, Aaskow, Navier, Amstein, Hufeland, and others. The substances usually employed as emetics were ipecacuan, tartar emetic, Kermes mineral, and oxymel of squills. They were generally exhibited at the commencement of the treatment, and occasionally in the course of the complaint. Lafosse and Remer gave them only at the commencement. Ipecacuanha was preferred by Linnæus, Aaskow, Thilenius, Weber, and many others; and oxymel of squills by Melzer.—Stoll considered emetics to be especially serviceable in hooping-cough during summer or autumn. Struve directed them in the evening; and Sims, after bloodletting.—Lettsom believed them to be useless, and Jones and Niemann to be absolutely injurious. Burton was amongst the first to condemn them, and he no less objected to bloodletting and cathartics, unless in inflammatory cases. In their stead he prescribed a mixture, the most active ingredient of which was tincture of cantharides. There can be little doubt of emetics having been occasionally abused by inappropriate exhibition; but experience has proved them to be most serviceable in this complaint, when judiciously employed.—At the present day, the means advised by Borsieri are the most generally applicable, and therefore the best, as far as it goes, that can be adopted. He prescribed a smaller or larger emission of blood early in the disease; a gentle emetic, occasionally repeated, where there is no symptom forbidding it; aperients of calomel, rhubarb, or manna, and external irritants. The only fault that can be found with this treatment, is the neglect of demulcents, anodynes, and antispasmodics, which are very generally beneficial in an advanced stage of the complaint.

54. Dr. Darwin insisted upon the frequent occurrence of peripneumonia during hooping-cough; and he therefore directed *leeches*, to prevent, as well as to remove, this complication. After evacuating the bowels, and giving diluents, and when the complaint had reached the second stage, he prescribed, for a child of about three years, a sixth of a grain of calomel, a sixth of a grain of opium, and two grains of rhubarb, twice a day. The only objection to this treatment is the too general use of opium

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[*] Appended to a case treated by Stoll, the history of which is given by Eyerel (*Op. cit.* t. ii. p. 184.), is the following note: — Decoctum *limacum*, in epidemica tussi convulsiva egregium et unicum sæpe fuit remedium, teste Haenio, qui a fœmina rustica Hagæ Batavorum id didicit. Adfuere aliæ epidemiæ ubi nil juvit, sed ubi Kermes mineralis et opium omnem absolvit paginam,—Decoctum hoc limacum per octo dies repetatur.

and the amount of the dose of it, for a child: in combination, however, with calomel, it is much less injurious than when given alone. He likewise employed antimonial emetics, mild cathartics, cool air, repeated blisters, or the tincture of cantharides internally, warm bathing, the inhalation of the steam of warm water containing a little vinegar, opiates in small doses, and digitalis. He prescribed digitalis, whenever a tendency to inflammation, or to effusion, or to pulmonary consumption appeared. He considered, with much justice, *diuretics* to be more or less useful in this, as in other disorders implicating the respiratory organs. Dr. Elliotson has very properly contended, that, wherever there is oppression of breathing, with violent spasmodic attacks of cough, accelerated pulse, and sonorous or crepitous rattle, inflammation of the respiratory organs is present, and should be treated by bleeding, by emetics, and by calomel. In such cases, sedatives and antispasmodics ought not to be resorted to, until inflammatory action is removed, and the secretions and excretions are freely evacuated.—It is unnecessary to allude further to the various modifications of treatment adopted by other experienced physicians. I shall, therefore, only notice some of the principal remedies prescribed for this complaint.

55. iv. *a. Bloodletting* was directed early in hooping-cough, by the great majority of writers, since the time of Sydenham to the present day; and frequently even in slight and simple cases, as a precautionary measure, particularly in plethoric habits. Lettsom has justly remarked, that, if it be not resorted to early in the complaint, it is seldom of service at an advanced period; but cases in which inflammatory affections of the lungs or brain arise at this period, furnish exceptions to this rule. Stoll prescribed depletion chiefly when the lungs became affected. Hufeland directed *leeches* to the chest; and Webster, to the temples, in most cases. I have seldom omitted to apply them behind the ears, or between the nape and occiput, or to prescribe *cupping* in this situation, at an early stage, influenced by the reasons stated above (§ 35.).— Of *emetics*, mention has already been made (41. 44.). — *Purgatives* have been employed chiefly with the view of evacuating accumulations of fæces, and of promoting the secretions and excretions. *Calomel* has been very generally recommended, both as an aperient and as an alterative. Fischer and Hargens gave it alone; but it has been more generally conjoined with rhubarb or some other purgative; and, in the inflammatory complications, with James's powder, ipecacuanha, &c. Darwin and Stroem prescribed it with rhubarb and opium; in which combination it is often beneficial at an advanced stage, and in patients above four or five years of age. The frequent use of *laxatives* or mild purgatives has been much insisted upon by Michaëlis and Kortum. — *Cathartic* or *irritating enemata* have been resorted to by Holdefreund and Hufeland.

56. *b. Diaphoretics and expectorants* have been generally employed through the course of the complaint; the former at the earlier, the latter at more advanced, periods. Some of these medicines promote both perspiration and expectoration, and are hence the more serviceable in severe or complicated states of the complaint. — *Antimonials,* in small doses, were praised by Fothergill, Weber, and many others. The solution of tartar emetic was employed by Hirschel; the golden sulphuret of antimony was preferred by Closius and Hannes. Van de Sande and Unzer gave it after having premised emetics, and Holdefreund conjoined it with sugar of milk. — The *Kermes mineral* was prescribed by De Haen, Hargens, Kortum, Hinze, and Styx. Quarin gave it with the flour of sulphur, gum-arabic, and extract of liquorice; but, although formerly in great repute in febrile and pulmonary diseases, it is now seldom employed. The following powder was once much used on the Continent for the cure of this complaint: —

No. 257. ℞ Kermes Mineralis, Pulv. Ipecacuanhæ, āā gr. j.; Ocul. Cancror. pulv. et Pulv. Acaciæ āā ℈ j. Tere bene, et divide in Cartulas vj., quarum capiat unam sextis horis.

57. This dose was prescribed for a child of one or two years. Much of the virtues of these powders was clearly attributable to the *ipecacuanha*, which is one of the most serviceable medicines employed for hooping-cough. — Hennings and Keutsch relied chiefly upon it, and gave it in minute and frequent doses. Hargens ordered it in considerable quantities; Krebs, in the form of infusion; Vogler, with opium, magnesia, gum arabic, and sugar; and Pearson, with opium and soda. — *Ammoniacum* and *squills* have been used as expectorants; but they require much caution, for, in the more inflammatory states of the complaint, they may aggravate the disorder, or even favour the occurrence of inflammatory action, in plethoric habits, or when the phlogistic diathesis is present. The *oxymel of squills* was frequently employed as an emetic, and often with benefit. Hufeland and Sulzer gave it with cinchona and extract of hyoscyamus, in the advanced stages of the complaint.

58. *c.* Numerous *antispasmodics* have been prescribed in the *second* and *third stages*, on account of the convulsive character of the affection. — *Assafœtida* was recommended by Millar; but was considered useless by Hufeland. *Castor* was given by Morris and Horn; *musk*, by Conradi, Gesner, Wolff, Von Berger, Hufeland, and Horn. Marcus conjoined musk with the sulphuret of antimony and magnesia. The *oxide of zinc* was praised by Crell, Percival, and Hart. Scheidemantel very judiciously employed it after evacuations. Winckler and Tode gave it with cinchona; and Starke, with cream of tartar; but, from this combination, tartrate of zinc must have been formed. Hargens, however, considered it inefficacious. I have but little experience of its effects in this complaint. *Camphor*, in very small doses, with diaphoretics, at an early period; and in larger quantities, with anodynes, other antispasmodics, or tonics, is often of great service, particularly after moderate depletion and alvine evacuations. The *subcarbonates of the alkalies* were given by Hinze, Memminger, Pearson, and Keutsch, and are often important adjuvants, in conjunction with hyoscyamus or other narcotics, and with rhubarb or other aperients, in the treatment of the second and third stages. I have, however, often preferred the *liquor potassæ* or Brandish's alkaline solution; especially in the scrofulous diathesis, and in cachectic habits. The subcarbonate of *ammonia*, in small doses, and other preparations of ammonia,

are frequently beneficial in cases of debility at an advanced period, or when the complaint is protracted. *Muriate of ammonia* was recommended by STOLL, at an early stage, with oxymel. I have found it an excellent refrigerant antispasmodic and tonic, in several instances.

59. *d*. The most energetic *narcotics* and *anodynes* have been prescribed, with a view of allaying spasmodic action, and generally in conjunction with some one of the antispasmodics or diaphoretics already noticed. *Opiates* were given by DE HAEN, with camphor and musk; by HUFELAND, in the form of DOVER's powder; by JACOB, with pectoral elixirs and spirits of nitric æther; by RÜLING, similarly combined, after four or five emetics; and by LEFOSSE and LETTSOM, in the second and third stages, with cinchona. WILLAN employed a watery extract of opium; and BRERA used it externally in frictions or in liniments. O the various preparations and combinations of opium, the paregoric elixir is indisputably the best in hooping-cough, especially when given with an alkaline subcarbonate, in almond or mucilaginous emulsions. The extract of the *lactuca virosa* was praised for this complaint by Dr. GUMPRECHT and others; and it has been much employed by some practitioners. *Conium* was first prescribed for hooping-cough by Dr. STOERCK and Dr. BUTTER. It was afterwards used by RANOË, SCHNEIDER, and HUFELAND. — LETTSOM and HARGENS considered it devoid of efficacy. I have prescribed it in numerous cases, and believe it beneficial when its virtues are not injured by preparation or age. It should not be given in the first stage.—*Hyoscyamus* was recommended by WOLFF, WIGAND, and JOERDENS; and by FISCHER, with vegetable bitters. It is nearly as beneficial as conium; but, in some patients, it is more liable to affect the head.

60. *Belladonna* has been extensively tried by Continental physicians in pertussis, and the powder of its root was most commonly employed; particularly by RANOË, BUCHHAAVE, FRANK, MEGLIN, and ETTMÜLLER; and by LAENNEC after the operation of emetics. SCHAEFFER and WIDEMANN gave it in large doses, and considered that it was quite a specific, particularly when administered in enemata. This is, however, a somewhat dangerous mode of prescribing it. The minute doses, recommended by WEZLER and HUFELAND, are much more judicious.—The extract of *tobacco* has likewise been prescribed by GESNER, THILENIUS, and HUFELAND; but it also requires much caution, and ought not to be tried with young children. The tincture of *Lobelia inflata* has been employed by Dr. ANDREWS, with benefit. When the convulsive cough is aggravated by the accumulation of viscid mucus in the bronchi, the exhibition of this medicine, until it produces vomiting, will be of great service. *Colchicum* was praised by HADEN and ALCOCK; and, when cautiously given in conjunction with magnesia, or the alkaline carbonates, or with either of the antispasmodics noticed above (§ 58.) it is of service in the inflammatory complications; but it may be very injurious in other circumstances, and particularly in very young patients. The same remarks apply to *digitalis*, as prescribed by DRAKE and DARWIN. *Hydrocyanic acid* has also been recommended by Dr. GRANVILLE and Dr. ELLIOTSON. I have seen much benefit derived from it, in the advanced stages of the complaint, particularly when given in conjunction with camphor, or with gentle tonics or demulcents. It should be most cautiously tried, if tried at all, with young children. Dr. ELLIOTSON, however, remarks, that a minim may be added to an ounce or two of almond emulsion, and a teaspoonful of this given them three or four times a day. *Laurel water* was much employed in hooping-cough by Continental physicians, and is still preferred by many to prussic acid.

61. *e*. Amongst *stimulants*, the tincture of *cantharides* has been most frequently employed. It was praised by FORBES, SCHAEFFER, and PLOUCQUET; and was prescribed with camphor and extract of bark, by BURTON; with antispasmodics and anodynes, by WOLFF, WIDEMANN, and HUFELAND; with preparations of cinchona, by CHALMERS; and with these and paregoric, by LETTSOM and GRAVES. I have prescribed it in a number of cases, and have found it diminish the frequency and severity of the fits, in the nervous states of the complaint, particularly when it occasioned irritation of the urinary organs. The extract of *nux vomica* was recommended by MICHAËLIS and HUFELAND, conjoined with the extract of *Carduus benedictus*. I have tried it with manifest advantage, in circumstances similar to those in which cantharides was employed. But neither the one nor the other ought to be resorted to in the first stage, or in the inflammatory complications. *Guaiacum* has been prescribed for pertussis, chiefly by HUFELAND and VEIZHANS; and *saffron* with castor, after due evacuations, by THEUSSINK and HARGENS. *Castor* was itself much employed by SAUVAGES, MORRIS, and HORN; and a decoction of unroasted *coffee* was given by HUFELAND. The *muriate of barytes* has also been noticed with commendation, by the writers just named.

62. *f*. The propriety of having recourse to *tonics* in the second and third stages, particularly the latter, cannot be disputed; but they ought not to be prematurely prescribed, especially in the second stage, and whilst a phlogistic diathesis is present even in the slightest degree. Of the various tonics, the preparations of *cinchona* are certainly the best. The infusion may be first given, conjoined with the solution of the acetate of ammonia, and subsequently the decoction with liquor potassæ or the subcarbonate of soda. The extract of conium or hyoscyamus, or paregoric elixir, may be added to either of these. *Bark* was strongly recommended by QUARIN, COURBETTE, and HOLDEFREUND. HANNES gave it with the sulphuret of antimony, and administered it in enemata; and SAUVAGES and MORRIS, with castor; BISSET, STOLL, AASKOW, WEBER, and MICHAËLIS, very judiciously premised sanguineous depletions, emetics, and purgatives, before they ventured upon it. MURRAY and HUFELAND gave it with cantharides in the latter stages. It is much more beneficial in some epidemics than in others. When the complaint is protracted, and assumes an intermittent or periodic type, particularly a tertian form, quinine, or cinchona ought never to be omitted.—The *arsenical solution* has also been employed in circumstances requiring the bark. It was much recommended by FERRIAR and SIMMONS, and is undoubtedly of service in these: but it is not superior to cinchona; and in children, especially, it is a much more hazardous substance. — I have given the *sulphate of*

zinc with great benefit in some cases; and the *nitrate of silver*, triturated with *extract of hop* or of hyoscyamus, with equal advantage in others. The *sulphate of iron* was very favourably noticed by Dr. Stanger, and is an excellent medicine in the third stage, or purely nervous state of the complaint; but it is not superior to the other preparations of iron, particularly the *ammonio-chloride*, and the *potassio-tartrate*.

63. *g*. There are various other medicines which have been employed internally against hooping-cough; but these require only a simple enumeration. Of the *Lichen pyxidatus*, mention has already been made (§ 50.) The *Lichen cocciferus* was recommended by Forbes and Von Woenzel; and the *L. Islandicus* by Weber. The *Ledum palustre*, *Tilea Europæa*, and *althæa officinalis* were prescribed by Wahlbom, Linnæus, Walter, and Wahlin; the *Geum urbanum*, by Keck and Buchhaave; *Phellandrium aquaticum*, by Van der Bosch; an infusion or extract of the *Narcissus pseudonarcissus*, by Dufresnoy; an extract of the *Mesembryanthemum*, by Wendt; and an extract of the *Cardamine pratensis*, by Comhaire and Veillecheze.—*Isinglass* was used in this complaint, by Heineken and Gautieri; *acetate of lead*, in small doses, by Forbes; *oxide of zinc*, with cicuta or belladonna, by Guersent, diluted *acetic acid*, with sugar, by Hannes; *sulphur*, by Sydenham, Quarin, and Unzer; and the *sulphuret of potass*, by several Continental physicians.

64. *h*. There are few complaints in which *external medication* has been so extensively or so beneficially employed, as in this. Although the *inhalation* of simple or medicated watery vapours does not strictly come under this head, I may here state, that it has been advised by Pearson, Darwin, and others. The observations as to this practice, in the article on *Inflammations of the* Bronchi (see that article), and as to the medicines that may used in this manner, entirely apply to hooping-cough. In the early stage, the vapour to be inhaled should be either simple or merely emollient. In the latter stages it may be slightly impregnated with camphor, or with some narcotic; but this practice can seldom be adopted for young children. The inhalation, in early or inflammatory states of the complaint, of stimulating vapours, is always injurious.

65. *i*. *External irritants* of various kinds have been prescribed. *Blisters* were applied to the chest, and between the shoulders, by De Meza, Paldamus, Quarin, and others; but the precautions stated above (§ 44.) should be observed, particularly in cases of infants and young children. Knebel directed *rubefacients* to the nape of the neck; Pelargus and Hufeland, to the lower extremities; Henning and Hecker, to the epigastrium; and Durr, to the soles of the feet. Various substances have been employed as external irritants. Henning recommended a cataplasm containing scraped *horseradish*; Struve, a liniment with tincture of *cantharides* and *tartar emetic*; and Zadig, the tincture of *ginger* applied to the epigastrium. Autenrieth prescribed an ointment containing tartar emetic to be rubbed upon the chest, or between the shoulders, or upon the epigastrium; and this practice was adopted by Kelch, Merrem, Nolde, and Michaëlis; but Horn and Schneider found it productive of little or no benefit. Autenrieth has received the credit of being the first to employ tartar emetic as an external irritant; but it was thus recommended long previously, by the older Monro. I have seen the incautious use of this ointment productive of dangerous, and even of fatal sloughing, in debilitated or cachectic children and infants. Loebenstein-Loebel advised a liniment containing a solution of *phosphorus* in oil of cummin and camphor to be applied on the epigastric region. From an extensive experience of external irritants in the treatment of pertussis, I prefer the *semicupium* or *pediluvium*, mustard and salt having been put into the water; the occasional application of a *mustard poultice* to the chest or epigastrium; *dry cupping* on the nape of the neck or between the shoulders; or *friction* with the following *liniment* along the spine, or the application of a piece of flannel moistened with it, on the sternum or epigastric region, according to the peculiarities and complications of the case: —

No. 258. ℞ Linimenti Camphoræ Comp., Linimenti Terebinthinæ, āā ℥ j.; Tinct. Capsici ʒ j.; Olei Caojuputi ʒ ss. vel ʒ j. Misce. Fiat Linimentum, vel Embrocatio.

66. Since the introduction of *vaccination*, it has been proposed by Okes, Cleeve, and Moutain, to inoculate with the vaccine matter as a preventive and as a cure of hooping-cough. This subject has been recently agitated, but without any conclusive evidence of benefit having been derived from the practice.

67. *k*. In the second, but especially in the third, stage of the disease, *change of air*, particularly to the sea-side, as recommended by Gregory and Hufeland, and *sea-voyaging*, are of the utmost advantage. For patients residing on the sea-coast, *frequent excursions* on the water will be highly beneficial, especially if nausea or vomiting be thereby produced. *Salt-water bathing*, commencing with the warm or tepid bath, and passing gradually to the cold bath or shower bath, will be found very serviceable, if no complication forbid it. The *diet* of the patient, in the first stage, should be antiphlogistic; and in the second and third it ought to be very light, chiefly farinaceous, and moderate in quantity. Over-distention of the stomach aggravates the fits, and favours cerebral congestions. Exposure to cold, or to vicissitudes of weather or temperature, running, &c., also, may induce inflammatory complications. Young children ought to be carefully watched at night, and be raised up as soon as the fit is threatened. Whenever the phlegm obstructs the fauces, it should be removed by a small thin piece of whalebone, bent in the form of a tongue-scraper, or by the finger of the nurse.

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HYDATID. — Syn. *Hydatis* (ὑδατις, a vesicle, from ὕδωρ, water). *Acephalocystis*, *Acéphalocyste* (from α, privative, κεφαλὴ, the head, and κύστις, a vesicle — a vesicle without a head), Laennec. *Vessie sans adhérence*, Cruveilhier. *Echino-*

coccus Hominis, Rudolphi and Bremser. *Polycephalus humanus*, *P. Echinococcus*, Zeder. *L'Echinocoque de l'Homme*, Lamarck. *Fischiosoma*, Brera. *Hydatide*, Fr. *Wasserblasse*, *Blasenwürm*, Germ. *Idatide*, Ital.

CLASSIF. — I. CLASS, V. ORDER (*Author*, in *Preface*).

1. DEFIN. — *Unattached vesicles, possessing a proper vitality, but dependent upon the parent body for the situations and conditions of existence.*

2. The term *Hydatid* has been very loosely employed by most writers, and even by many of the present day. It has been used by some as a generic appellation, not only for the several species of vesicular worms, or vesicles with one or more distinct heads, but also for the vesicular bodies now under consideration; and by others the name has been very improperly extended to those simple *cysts* which are produced from, and connected with, the surrounding tissues. In this article I shall consider only those vesicular bodies which do not possess distinct heads, but which present signs of a proper vitality, as constituting *true hydatids*; and shall refer the species, *Cystocercus*, *Polycephalus*, and *Ditrachyceros*, arranged by CLOQUET, KERR, and others, under this head, to that of *vesicular* WORMS. As to the species *Echinococcus*, described by RUDOLPHI, ZEDER, and others, I believe it, with BRERA and BREMSER, to be merely a variety of the *acephalocystis*. Simple *cysts*, or pseudo-hydatids, are altogether distinct formations from those under consideration; but I shall also briefly notice them. (See art. DISEASE, § 113—115.)

3. The name *Acéphalocyste* was applied by LAENNEC to an organic production, consisting of vesicles or spheroidal globules contained in a distinct cyst, which isolates them from the surrounding tissues, and with which they have no kind of connection. Although these productions scarcely merit to be elevated to the rank of a distinct species in animal existence, yet they must be considered, in pathology, to possess an individual vitality. They thus form one of the several species of *parasites*, to which the human frame often furnishes origin and nutrition, and which not infrequently destroy the parent body. (See PARASITICAL PRODUCTIONS.) When it is considered that they present nearly the same form and appearance, that they are unconnected with the surrounding tissues, differing only as to size; originating, without any determined cause, in the very substance of our organs; developing and multiplying themselves; and manifesting their existence only by the compression of adjoining structures, whence often result the most serious effects, and even death itself; it must be admitted that they deserve a due share of attention.

4. *Hydatids* were probably known to the ancients, although imperfectly; as HIPPOCRATES, CELSUS, GALEN, and ARETÆUS mention the existence of cysts in many of the states of disease in which they are met with in the present day; but no precise description of them was given until 1685, when HARTMANN directed attention to their animalcular nature. In 1691, Dr. TYSON published a paper (No. 193.) in *The Philosophical Transactions*, "to prove that hydatids, often met with in morbid animal bodies, are a species of worms or imperfect animals." Since that time, they have been particularly examined by PALLAS, LINNÆUS, MÜLLER, HUNTER, MONRO, GOEZE, BLOCH, LAMARCK, CUVIER, BRERA, RUDOLPHI, ZEDER, LAENNEC, BREMSER, CLOQUET, CRUVEILHIER, and others.

5. I. DESCRIPTION OF HYDATIDS, AND OF THE CYSTS CONTAINING THEM. — M. CRUVEILHIER remarks, that, if we represent to ourselves soap-bubbles of various sizes, the contained air being replaced by a fluid of perfect limpidity, the envelope formed by a film of coagulated white of egg, we shall have a very exact idea of acephalocystes. They vary in size from a millet seed to that of the largest orange; their form is spheroidal; and their specific gravity is nearly the same as water, although they generally sink when plunged in this fluid. When compressed, they resume their spherical form as soon as the pressure is removed. They are in general transparent and clear; sometimes only translucent; it is but rare that the fluid they contain is at all turbid. The various tints they present depend upon their envelopes, which have sometimes an opaline hue, either in particular points, or throughout their surface. Frequently semi-transparent flocculi are seen swimming in the liquid, and appear reticulated or plaited. M. CRUVEILHIER considers these as the débris of the internal pellicle of the hydatid, and the result of changes after death. Their external surface is generally smooth, uniform, and without crochets, or suctoria; and when their fluid is evacuated, they present neither heads nor mouths — *Hydatis lævis.* — If, therefore, they are to be considered as possessing individual animal existences, they are the simplest and lowest of animal creation. Examined with the microscope, the opaline appearance of their parietes proceeds sometimes from a thickening of the membranes forming them; at other times, from small whitish and hard granulations on their interior surfaces. They are without the smallest appearance of vessels of any kind.

6. When punctured, the contained fluid escapes in a jet tolerably strong and continued; the envelope, eminently elastic, contracts, and presents only about one third of its former capacity, and acquires double or treble its former thickness. Although transparent at first, it becomes semi-opaque, or opaline; and, although very extensible and elastic, it tears readily when it reaches the limits of extension. The fluid of an hydatid is not coagulated by heat, but it contains a little albumen and some salts, amongst which the chloride of sodium is predominant. The membrane, according to M. COLLARD, is composed of — *first*, an albuminiform substance, which, however, differs from albumen in being soluble in hydrochloric acid: *second*, of a substance analogous to mucus, but differing from mucus in its insolubility in alkalies; in its want of action on the acetate of lead; in its great solubility in the hydrochloric, sulphuric, and nitric acids, without the disengagement of gas; and in the circumstance of water restoring its physical and chemical properties after it has been dried. From these M. COLLARD infers, that the hydatidic parietes consist of a peculiar substance.

7. Anatomically, they are composed, according to M. CRUVEILHIER, of four or five membranes, or laminæ, of unequal thickness, each membrane also varying in thickness at different points; whence result their various degrees of opacity and trans-

parency. The small whitish granulations, already mentioned, are frequently found on the interior surface of the larger hydatids; but they are often wanting, especially in the smaller. They possess no regular form, but are elevated on the internal surface, carrying before them the internal pellicle. HIMLY says that some hydatids possess another internal membrane, which is remarkably thin, but presenting here and there, or in groups, corpuscles of a glandular appearance; and that these inclose hydatids of a minute size, thereby illustrating the system of the inclosure of germs. BREMSER has seen, in free hydatids, globules likewise unattached, in the interior of which still smaller globules existed; successive generations thus appearing in the same cyst. Dr. JOHN HUNTER and LAENNEC also consider the granulations or attached corpuscles to be young hydatids; and the numerous minute vesicles observed with the microscope diffused through the fluid contained in a hydatid, to be of the same nature. Dr. HUNTER remarks, that, in their growth and decay, they pass through various stages: they are at first found floating in the fluid that fills the hydatid, and afterwards attached to its coats. The hydatid, thus pregnant with young, adheres to the neighbouring parts, increases in size, and becomes itself a sac, containing numerous small hydatids. These, after a certain time, decay, and the skins or empty bags are squeezed together into a substance resembling isinglass; and it is probable that they undergo still further changes.

8. Besides these minute granulations on the interior surfaces, and still minuter vesicles detected in the contained fluid, and considered by M. CRUVEILHIER to be the débris of the internal pellicle, as described above (§ 5.), M. LAENNEC has remarked, in some instances, small germs or sprouts of an irregular form or size on the exterior surface. These he considers as nascent hydatids, which in a certain stage of growth are detached, and increase the number in the surrounding fluid. According to these writers, and to Dr. BARON and Sir A. COOPER, hydatids may be so produced as to form a number of concentric layers, resembling the crystalline lens, or the coats of an onion, with the fluid interposed between each layer. In such instances, it is to be presumed that the most internal is the last formed, and that the more external become condensed, and ultimately disrupted and altered by the developement of those in the centre.

9. M. CRUVEILHIER distinguishes hydatids into *two varieties*—the *solitary* and the *multiplied*—the *Acephalocystis eremita vel sterilis*, and the *A. socialis vel prolifera*. The first is most common in the lower animals, the second in man. The former rarely is confined to one situation, organ, or part, but invades several organs, or even a number of parts at the same time; the latter is as rarely produced in several parts of the same body, or even in different parts of the same organ.—*a.* The *solitary hydatid* is often found in thousands in the lungs, the liver, &c. of ruminants. M. CRUVEILHIER observed them at the same time in the lungs, the spleen, the kidneys, and the heart, of both sheep and oxen. The enveloping pellicle of the hydatid is altogether similar to that covering the interior of the cyst, but is without any kind of adhesion to it. This pellicle is semi-transparent, and presents a number of whitish points or granulations. The inclosing *cyst* is generally fibro-cartilaginous, and is not always spherical. Sometimes one or several partitions separate the cyst into as many cells, in each of which a hydatid is lodged, and exactly moulded. The tissue of the organs surrounding these cysts is quite unaltered.

10. *b.* The *multiplied hydatids* are always in greater or less numbers. From an hundred to a thousand may be contained in the same cyst or sac, varying from the size of a millet seed to that of the closed hand. They swim in a fluid presenting varying appearances. Sometimes this fluid is perfectly limpid; at others it is yellowish, especially in the hydatidic cysts formed in the liver; and it occasionally is puriform or purulent; yet, in this latter case, the hydatids themselves usually preserve their limpidity,—a circumstance, amongst others, proving their independent existence. When the fluid of the cyst, in which the hydatids are contained, is otherwise changed, and especially when it becomes more consistent, or presents characters materially different from the above, the hydatids are disrupted, broken down, emptied, and apparently dead.

11. *c.* The *cysts* which inclose either variety (the solitary or multiplied) of hydatids, is generally strong and composed of several laminæ, which separate easily, and present the characters of fibrous tissue. They frequently contain cartilaginous or ossific patches; and the thickness of their parietes is usually in proportion to their size and age. They are externally adherent to the surrounding tissues by loose cellular substance; but they are occasionally attached more firmly by a cellulo-fibrous structure. The organ in which they are situated is commonly unchanged; but when pressure is exerted by them, the surrounding parts are atrophied, or converted into a fibrous substance. The internal surface of the cysts is often rugose, and rarely polished or quite smooth. It has not the appearance of sero-fibrous surfaces, and yet it secretes the fluid in which the hydatids swim. It sometimes presents cracks or crevices, or solutions of continuity, from the distention caused by the growth of the hydatids, and increase of the fluid filling the cysts.

12. The hydatidic cysts are lined by a membrane, similar in all respects to that which constitutes the proper parietes of the contained hydatids, and presenting the same elasticity, fragility, colour, and physical and chemical properties. This membrane may be separated into several lamellæ. Its thickness is in proportion to its capacity. Its external surface nowhere adheres to the parietes of the cyst, and its internal surface is quite smooth. M. CRUVEILHIER considers it to be a large hydatid, enveloping and containing those which are smaller. It lines not only the cysts of the multiplied hydatids, but also those of the solitary. In the former, however, its internal surface is studded with minute granulations, some of which are isolated, and the others agglomerated. These granulations, as in the case of those observed in the interiors of the larger hydatids, are doubtless the germs of the free and smaller hydatids.

13. When a morbid action exists in the parietes of the sac, or cyst, or when they secrete pus instead of serum, then the enveloping acephalocyst is detached, and its débris are found mixed with the puriform secretion. The granulations or germs

are also altered, and the contained hydatids are often more or less changed. In such cases, the morbid secretion from the internal surface of the diseased cyst is destructive to the vitality, first of the enveloping or parent hydatid, and consecutively of those which it contains.

14. The vitality and independent existence of hydatids are shown not only by their reproductive powers, but also by the preservation of the animal substances composing them from the changes, or the decomposition, which these substances always undergo when they lose their organic connection with living parts. Yet, although thus possessing a certain, but a low, amount of vitality, they cannot be elevated to the rank of animals; for they possess neither sensibility nor mobility, although their parietes present signs of organic contractility. They may be viewed, therefore, as the lowest or incipient states of separate animal organisation, from which there is a gradual rise in the scale of existence, through the vesicular and flattened parasitic worms, up to the more perfect animals.

15. *d.* Hydatids undergo many *consecutive changes*, some of which originate in disease, either of their containing cysts, or of themselves. Occasionally these cysts break, either exteriorly or into a serous cavity, or upon a mucous surface; and this occurrence may be either fortunate or fatal, according to the situation in which it takes place. If the rupture occurs on a cutaneous or mucous surface, the admission of air causes prolonged suppuration. If it occurs in a serous cavity, which is rarely observed, fatal inflammation is thereby occasioned. Frequently, however, owing to the death of the hydatid, absorption of the fluid in the cyst takes place; the parietes contract, and approach towards the centre; and the remaining contents become remarkably changed, and often assume a tuberculous, putty-like, cheesy, or purulent form, the hydatidic membranes being pressed together, or otherwise altered. According to RUYSH, BREMSER, and others, hydatids may thus degenerate into atheromatous, steatomatous, or melicerous tumours, especially when they occur in the ovaria. This opinion has been zealously and ingeniously argued for by Dr. BARON. He supposes that the hydatid, or vesicular form, is that in which tuberculous, scirrhous, sarcomatous, steatomatous, and fungous productions originate; and that the transformation may take place at any period, or may not occur at all. The co-existence of hydatids with one or other of these formations has been urged in proof of this doctrine; but there has been no evidence of any of these having originated in hydatids, nor has the transition of the one morbid structure into the other been even partially demonstrated. The co-existence of these different productions in the same subject, that is sometimes observed, and that furnished the chief basis of this doctrine, is merely a coincidence arising out of a fully ascertained circumstance,—that the same states of constitution, of vital activity, and vascular action, which favour the production of the one structure, also predispose to the other.

16. II.—PSEUDO-HYDATIDS, SIMPLE CYSTS, or *vesicles*, have been very commonly confounded with true hydatids. From this circumstance it will be necessary to take some further notice of them at this place, than has been taken in the article DISEASE (§ 113—115.). They are found either entirely or partially in contact with the adjacent tissues, are supplied by these with the fluid they contain, and are nourished by them. Dr. KERR has divided them into two varieties, viz. those which consist of *simple cysts*, or bladders capable of being detached without lesion of structure, and those which are *compound*, and which appear as diverticula from the subjacent membranous expansions, from which a separation at their bases cannot take place without laceration of a part essential to the integrity of one or the other.—*A.* Under the *former head* may be arranged—1st, those cysts met with under the common integuments, that contain a sebaceous, atheromatous, or meliceritious substance, secreted by the cyst, and causing its distention;—2dly, those cysts formed by complete obstruction of a canal conveying secreted fluids, as ranula, those found in the labial glands, and the surface of the kidneys, &c.;—3dly, those proceeding from the distention of cells naturally existing in organs, by a morbidly increased and altered secretion; as in ovarian dropsy, and disease of the thyroid gland;—and, 4thly, those serous cysts often found in the plexus choroides, sometimes in the eyelids, more rarely in the lungs, the female mamma, and other parts of the body. These last sometimes acquire a large size, especially when seated near the surface of any of the abdominal or thoracic viscera, and constitute encysted dropsy. The cysts belonging to this class are generally simple, distinct, and solitary. When two or more of them are developed in one part, as in the plexus choroides, the association is owing to the same cause which produced the one, having likewise operated in its neighbourhood. This has been well shown by Dr. HODGKIN. (*Med. Chirurg. Trans.* vol. xv. p. 266.).

17. The *formation* of this species of cysts, especially of those which cannot be referred to the obstruction of canals or orifices of ducts, has been a subject of much speculation. It has been supposed by some, that they are produced by the obstruction and consequent dilatation of absorbents, or of other vessels not admitting the passage of red blood. This, however, is only a supposition. In a paper which I published in 1821 (*Lond. Med. Repos.* vol. xv. p. 378.), I suggested their origin in effusion into one or more cells of the areolar tissue, the state of the effused or secreted fluid, and the changes in the tissue immediately surrounding and confining the fluid, preventing the diffusion of the secretion in the adjoining parts, and giving origin to the parietes of the cyst. If serum accumulates in one or more of these cells, owing either to morbidly excited action, or to impaired absorption, in connection with an impermeable state of the surrounding tissue, this latter will be impacted around the collected fluid, and the albuminous portion of this fluid will attach itself to and line the sides of the cavity thus formed. As the effusion increases, this cavity will enlarge; the parietes formed by the impacted areolar tissue will become firmer and denser; the albuminous portion of the secretion will continue to attach itself to the parietes, if it be in small quantity, where it will become organised, or even converted into a serous surface; and the cyst will present several coats or laminæ, thus produced from the condensed surrounding tissue, and from the successive depositions of albuminous pellicles on its internal surface from the secreted

fluid. At the same time, it is not improbable, that many of the simple cysts are actually formed before the fluid they contain, as supposed by BICHAT, and as admitted by me, in the article DISEASE (§ 115.). The fluid in the cyst, particularly when it is thick, or more remarkably albuminous, or muco-albuminous, may undergo various changes, arising either from its properties at the time of its secretion, or from the states of local and general action and of constitutional or vital power. These changes may also be further aided by partial absorption of its watery parts, or by the tendency of its chemical elements to form new combinations, when removed to a certain extent beyond the vital influence, and still subjected to an elevated temperature. To these circumstances may be attributed most of the appearances observed in the contents, as well as in the tunics, of the class of *simple cysts*, and described in the article DISEASE (§ 113—115.), whether the cysts are first developed as a serous membrane, or are formed by the fluid effused into the areolar tissue.

18. *B.* The *compound variety* of cysts (§ 16.) are those whose parietes possess the property of producing other cysts of a similar character to themselves, or, as Dr. HODGKIN has shown, other morbid growths, which, if they do not present, strictly speaking, the character of cysts, are nevertheless referrible to the same type or mode of formation. Cysts of this kind, like simple cysts, are found in different parts of the body, but are by far most frequently seen, acquire the largest size, and present the greatest variety of appearances, in connection with the female organs of generation. In this variety, elevations more or less rounded, and of various sizes, are observed projecting on the interior surface of the principal cyst, and are covered by a membrane continuous with that lining the interior of this cyst. Dr. HODGKIN remarks, that on making an incision into these projecting elevations, they are found to be cysts of a secondary order, filled by a secretion, often serous, but almost as frequently mucous. On an intimate inspection of those secondary cysts, the germs of other or tertiary cysts are also found projecting from their interior surfaces, upon which is reflected the lining membrane of the cyst in which they are contained. Secondary cysts sometimes afford as complete specimens of a reflected serous membrane, as either the pericardium or the tunica vaginalis; the lining membrane of the containing cyst corresponding to the reflected portion, as that covering the contained bunch of cysts does to the close portion. The proportion which the contained cysts bear to the cavity of the membrane reflected over them, is extremely various. Sometimes the fluid, especially when it is serous, nearly fills the containing cyst, whilst the bunch of secondary cysts is of very inconsiderable size. At other times, the principal cyst is almost entirely filled by those of the inferior order; in which case the nodulous or tuberose elevations found on the exterior of the former, are occasioned by the unequal developement of the latter. It may even happen, that the distention, caused by the growth of the contained cysts, is sufficient to produce a rupture of the containing cyst, which admits both of the escape of its fluid contents, and of the unrepressed growth of the secondary or tertiary cysts, which took their origin from its internal surface. As the inferior cysts themselves are found to contain, as Dr. HODGKIN has shown, a serous or mucous secretion, and very often to produce another order of cysts, possessing the same character with themselves, it is by no means surprising that these different orders of cysts, which sometimes have the appearance of delicate and pellucid vesicles, filled with clear and colourless serum, and possessed of the power of giving rise to a multitude of vesicles or cysts presenting the same character with themselves, should have been mistaken for true hydatids. But a little careful inspection would have shown that the bunches or clusters of secondary cysts are invariably attached to and continuous with the internal surface of the primary or containing cyst; and that delicate vessels ramify from the one upon the other.

19. It is reasonable to infer, that these compound cysts will present diversified appearances, and give rise to various changes, according to their duration, to the state of vascular action in the parts in which they are formed, and to the constitutional or vital power of the patient; and that, according to the alterations which may take place in these cysts and in their contained fluids, adventitious formations of various kinds, and even scirrhous and carcinomatous structures, may be ultimately developed. — My limits will not permit me to describe the various appearances which these compound cysts may present, in different situations, and at different epochs of developement, or to trace the various changes they undergo, and far less to speculate upon their transformations into malignant or other structures. I must, therefore, refer the reader to Dr. HODGKIN's ingenious and able paper on this subject.

20. III. TRUE HYDATIDS have been found in almost every organ or structure of the human body. Instead, however, of considering them at this place with reference to *their seats* in the brain, in the lungs, in the heart, in the liver, in the kidneys, &c. &c., I have, conformably with the plan of this work, noticed their occurrence in these organs, in the articles devoted to the pathology of the several viscera. In these articles, as well as in some others, the *symptoms* they occasion, and the *treatment* they require, in their various *localities*, are more fully and sufficiently discussed: I here confine myself to a general view of these subjects.

21. IV. REMOTE AND IMMEDIATE CAUSES. — *a.* Attention to the circumstances in which hydatids present themselves in man and in the lower animals proves, that they generally originate in whatever impairs vascular activity and vital power; and, of the causes which produce this effect, none are more influential than unwholesome and insufficient food, living too exclusively on vegetable diet, and residence in humid, cold, and low situations. Indeed, in the lower animals, they may be produced at will by insufficient nourishment, by humidity, and by food consisting chiefly of green succulent vegetables. Conjoined with these, debility arising from previous disease, convalescence from febrile or epidemic maladies, and the depressing passions, exert more or less power. There is reason also to infer that local injury, as well as local debility, has some share in determining the seat of these parasitic productions.

22. *b.* Various attempts have been made to account for their *origin*. BIDLOO believed them to arise from the dilatation of lymphatic vessels; the

valves forming a limit to the vesicles. M. Andral has recently attributed their origin to a deposit of a fibrinous clot in the areolar or other tissues. He supposes that a minute fibrinous concretion, secreted by blood-vessels in a state of morbid action, assumes an incipient form of organisation, and that hydatids are an advanced grade of such organisation. This supposition is supported by the well known fact that fibrinous concretions formed on serous surfaces, although at first amorphous, ultimately become organised. As the origin of true hydatids is susceptible of the same explanation as that of the *Vesicular and other Parasitic* Worms, the reader is referred to what is advanced on this subject in the article Worms.

23. V. Symptoms.—The formation of hydatids being attended by no appreciable lesion of function or of vascular action, the general symptoms are most uncertain, if, indeed, they be not entirely unascertained, especially in the early stages of this malady. Hydatids are developed so slowly and so entirely without vascular determination and excited action, that the organs in which they are seated adapt themselves to the pressure or slight displacement of parts they may occasion. When, however, they are seated within the cranium, or when their bulk in other situations becomes great, then the disorder they may occasion is made more manifest; although, even then, the constitution may not sympathise very remarkably with the local alteration. It very frequently happens, that no idea has been entertained of the existence of these productions, in persons who have laboured long under slight ailments, until detected accidentally in a *post mortem* inspection. It is only when the hydatidic cyst has acquired a volume so considerable, as to give rise to a palpable or visible tumour, that we can suspect its nature. In such cases, the suspicion is rendered more probable, when some degree of fluctuation, attended with a tremulous sensation, is perceived. This symptom, however, is illusory; for it attends other deep-seated collections of fluid. When, owing to the death of the hydatids, or to inflammatory irritation, or rupture of the containing cyst, suppuration affects this latter, then hectic fever, discolouration of the general surface, emaciation, and other attendants of organic lesion, take place. It sometimes happens that inflammation extends from the cyst to the adjoining parts, and that the morbid production thus makes its way either to the surface of the body, or into some internal cavity or canal. When it opens exteriorly, the nature of the malady then becomes manifest, and the recovery of the patient even possible.

24. VI. Treatment.—Our imperfect knowledge of the causes and symptoms of hydatids necessarily renders the prevention and cure of them also very imperfect. Such of the causes as seem to be more fully ascertained, should be avoided, and those general principles of treatment, found to be most successful when the human body is the seat of parasitic productions, should be adopted. I have shown, in the article Worms, that the chief principle of cure, next to the discharge of the parasitic animals, is to impart tone and vigour to the constitution, so as to enable it to resist their reproduction or increase, and to throw them off with the secretions and excretions, when a more immediate and direct removal of them cannot be effected. We may consider as axioms in pathology and therapeutics, that parasites form, multiply, and increase, in proportion as the parent becomes weakened, and as the secretions and excretions accumulate, or are retained; and that they diminish, and ultimately disappear, with the full restoration of the vital power, and of the secreting and excreting functions of the animal which produced them. The practical application of these axioms to hydatids is very manifest. The principle being admitted, the selection of individual means will depend upon the seat of these productions, and upon the peculiarities of individual cases. In most instances, however, the preparations of iron, those of iodine, the iodide of iron, chalybeate mineral waters, camphor, and the balsams, the various vegetable and mineral tonics, and the promotion of the secretions and excretions, by a combination of mild purgatives with stomachics and bitters, will be appropriate.

25. With respect to the propriety of *puncturing* the hydatidic cyst, in circumstances appearing to require this measure, much will depend upon its seat, with respect to the external surface, to serous membranes, and to internal canals. For, where this operation is likely to risk effusion into an adjoining serous cavity, as into the peritoneum, or to induce inflammation of a serous membrane, it ought not to be attempted. When the cyst is seated near, or has reached, the exterior surface; when inflammation and adhesion have obliterated any cavity intervening between it and the exterior; and when the integuments have become inflamed and acuminated, so as to point out the situation where only a puncture should be made, then it may be undertaken. As to the other points of treatment, they will come under consideration in the places where hydatids, seated in the internal viscera, are discussed.

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HYPERTROPHY.—SYN. *Hypertrophia*, (from ὑπερ, above, and τροφὴ, nutrition,) *excessive nutrition*. *Hypertrophie*, Fr. *Die Uebernährung*, Germ. *Enlargement of a tissue or organ from excessive nutrition.*

CLASSIF. — GENERAL PATHOLOGY. *Morbid Structures, General Therapeutics.*

1. *Hypertrophy* is a term introduced by French pathologists to signify excessive nutrition of a tissue or organ, and often very loosely employed by them, and by some recent English writers, whose imitation of the former has been more close than judicious. According to the derivation and definition of the word, hypertrophy should be applied only to an increase of nutrition of a tissue beyond what is natural, and not to the augmented bulk arising from adventitious depositions in areolar or other structures. To this latter, however, it has been frequenly applied by some recent authors. M. CRUVEILHIER has suggested a division of hypertrophy into the *physiological* and *pathological*; but the one variety frequently passes into the other, or the only difference between the two may be that of locality. All the pathological facts, he adds, relative to hypertrophy, may be referred to the three following heads: *first, simple and pure hypertrophy*; *secondly, hypertrophy with induration*; and *thirdly, hypertrophy with transformation*. But, as M. ANDRAL justly remarks, the term hypertrophy should be applied exclusively to those cases in which the tissue, whose volume is increased, retains its natural structure and organisation. Hypertrophy, thus restricted, may exist in any one of the various elementary tissues, or even contemporaneously in two or more of them. It may also occur in organs formed by the combination of several of these tissues, and there affect only one, or extend itself to two or more. In either of these states, hypertrophy may be considered as a simple lesion, although it may be attended by increased firmness and density, which are generally observed to exist in hypertrophied tissues. It more frequently, however, occurs in complicated states, or associated with some transformation of, or deposition in, collatitious or adjoining textures. In such cases it is difficult to determine whether the hypertrophy, or its associated alteration, is the primary lesion, or how far the one may be dependent upon the other. In many instances of hypertrophy of one tissue, the collatitious tissues are more or less atrophied; in this case the sequence and dependence of change are manifest. From these considerations, hypertrophy may be divided into, 1st, the *simple*, and, 2dly, the *associated* or *complicated*; the latter, however, being so diversified as to preclude a description sufficiently brief and consistent for this article. The subject, however, under both these heads is sufficiently discussed in the articles devoted to the pathological anatomy of the individual tissues and organs.

2. I. NATURE OF HYPERTROPHY.—When this change occurs simply, without any associated alteration, it can be referred only to an excess of nutritive function; and an active state of the circulation, dependent upon increased nervous power, may be considered as the conditions requisite to this ex-

cessive state of nutrition. This fact is proved by the physiological consideration of the subject, especially by those employments in which particular muscles are principally exercised and consequently developed. In these instances, volition determines a more frequent and energetic contraction of certain muscles, and such contractions require an increased supply of blood: whence, ultimately, results augmented developement. What is familiarly demonstrated in the voluntary muscles also takes place in the involuntary, under analogous circumstances; thus, the constant or repeated efforts made by the ventricles of the heart, by the parietes of the stomach, by the urinary bladder, or even by the intestinal canal, to overcome an obstacle placed at their outlets, or to procure a free passage for their contents, are followed by excessive developement of their muscular structures, and are attended by a relative increase of their vascularity. In these instances, the first change in the hypertrophied part is manifestly excited or increased organic nervous influence. This determines not only excessive muscular contraction, but also augmented vascular determination, and, as the general result, superabundant nutrition. On this point, the opinion of Dr. Carswell, who has written with more precision on this subject than any of his contemporaries, does not materially differ from my own. He fully admits that an increased supply of blood is necessary to hypertrophy, but has left out of consideration the share which the nervous power has in the production both of this increase, and of the excessive nutrition which follows. He justly remarks, that the nature of hypertrophy merits due consideration, as involving the principle on which the treatment of it should be founded, and as establishing a law directly opposed to the doctrine that this lesion is the primary element of certain adventitious structures. M. Andral has proposed this doctrine, and has contended, that hypertrophy of the cellular tissue forms a necessary condition in the production of scirrhus and carcinoma. But, although the cellular tissue may be more or less hypertrophied in these maladies, this alteration is associated with others less physiological, and infinitely more morbid than it, in their vital and organic relations.

3. II. Causes and Origin.—Hypertrophy, in some of its forms, or with reference to certain tissues, may depend upon a predisposition existing in the organisation. Some persons have an hereditary predisposition to an excessive developement of the adipose tissue; obesity occurring in these, however abstemious they may be. Others present also an hereditary predisposition to enlargement of the bones, or of the lymphatic, or other glands. The common *exciting causes* of hypertrophy are,—*first*, the increased action of a tissue or organ; *secondly*, the prolonged influence of an irritant or stimulus. Either of these classes of causes may induce hypertrophy, in its *simple* or *complicated* forms.

4. *A. Increased action or function* of a part gives rise most frequently to hypertrophy in its *simple form*. It then may be considered as purely *physiological*; thus, the blacksmith has the muscles of his arms powerfully developed, and the opera-dancer, those of his lower extremities. The hypertrophy in such cases is frequently attended by an atrophy of other muscles, not brought into action. The drayman, or coalheaver, has the muscles of the arms and trunk strongly formed, whilst those of the legs are imperfectly developed, their action being confined, or entirely suppressed, by the thick-soled shoes they are accustomed to wear, and by their shuffling gait. Increased function, or action of the heart, is often followed by excessive nutrition, even independently of lesion of the orifices and valves. Obliteration of an arterial, or venous trunk, causes enlargement of the collateral vessels. Destruction of one kidney, or of one lung, gives rise to marked augmentation of the size of the other. Obstacles to the evacuation of the contents of the hollow viscera occasion hypertrophy of the parietes of these viscera, owing to the increased action required to overcome these obstacles; but the increased action in such cases operates similarly to that produced by excited function, in the circumstances just adverted to.

5. *B. The protracted operation of a morbid stimulus, or irritant*, is the most common cause of these forms of hypertrophy, which may be denominated *pathological*, and which are most frequently *complicated*. These forms were arranged by Dupuytren under the denomination of *nutritive irritations*. They are not always instances of pure hypertrophy; but, as they often result from a state of chronic inflammation, so they are attended with, and even partially dependent upon, a deposition of coagulable lymph, which has become more or less organised and identified with the tissues in the areolæ of which it has been effused. There is every reason to believe, that many of the cases of hypertrophy said to have been observed in the cellular, serous, mucous, and glandular structures, either singly or complicated with other lesions, were actually referrible to this category. Indeed, it is by no means easy to distinguish the enlargement caused by the effusion of lymph, which has become thus organised from pure hypertrophy, particularly as respects the tissues just enumerated, and when other organic lesions are also present in the affected part. That, however, hypertrophy actually takes place from prolonged irritation, is proved by the changes produced by this cause in the integuments, the mucous, and serous surfaces, the cellular tissue, &c. Most of the forms of associated or complicated hypertrophy, noticed in the articles on the pathological anatomy of the different tissues and organs, are referrible to causes which fall under this head.

6. III. Characters.—*a.* Increase of *bulk* is not always characteristic of hypertrophy; for hollow viscera, as the heart, stomach, urinary bladder, &c., may have their parietes very much thickened, without their dimensions being externally augmented. Hypertrophy may exist even although the apparent bulk of the organ is diminished. In such instances the thickness of the parietes must be considered with reference to the external dimensions and internal capacity of the organ.—*b.* The *form* also of a tissue or part will also be changed or modified in some degree, but chiefly when the hypertrophy is circumscribed. This is demonstrated most remarkably in cases of hypertrophy of the bones, skin, mucous tissues, &c. — *c.* The *consistence* of the hypertrophied part is generally somewhat altered. It is most commonly more or less increased, particularly in the cellular tissue,

lymphatic glands, brain, skin, &c. Diminished consistence is never met with, excepting in some rare instances of complicated hypertrophy, when the enlarged tissue has experienced consecutive change.—*d.* As increased size, and generally also augmented density, or firmness of the hypertrophied tissue, obtain, it must necessarily follow that the *weight* of the part is also greater.—*e.* The *colour* is increased, unless the blood-vessels are compressed by the enlarged structure; as sometimes observed in the brain, in the bones, and cellular tissue.

7. IV. The EFFECTS of hypertrophy are—1. Increased action relatively to the augmentation of size, as in hypertrophy of the heart, of the urinary bladder, &c. 2. Compression and atrophy of the collatitious textures, particularly when one or more of the tissues of an organ or part is enlarged. 3. Diminution of a cavity, or of the canal of an organ, as in concentric hypertrophy of the ventricles, and in some instances of hypertrophy of the urinary bladder, or of portions of the digestive tube. 4. Compression of adjoining organs, when a viscus is greatly enlarged; and, 5. Augmented developement of the vascular system of the hypertrophied part.

8. V. The GENERAL TREATMENT of hypertrophy may be conducted with the following *intentions:*—1. The removal of the exciting and pathological causes, when this can be attempted. 2. The diminution of the quantity and richness of the blood, by depletions and low diet, as far as may be consistent with the circumstances of particular cases, and localities of this lesion. 3. The prevention of local determination of blood, particularly to the hypertrophied organ or part, and the derivation of it to other situations. 4. The avoidance of local and general excitement, and the procuring, as much as possible, the repose of the affected organ. All these intentions are not equally applicable to every case, and some of them should be entertained with caution in certain circumstances. Thus, when hypertrophy depends upon repeated efforts to evacuate fully an organ, the second indication ought to be either very cautiously or very partially fulfilled. The particular means or remedies which may be selected to accomplish these intentions should depend entirely upon the seat of the lesion, and the peculiarities of individual cases; they are fully noticed in the places where the particular forms of hypertrophy are discussed.

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HYPOCHONDRIASIS.—SYN. Ὑποχονδριον, the Hypochondre; ὑποχονδριακος, adj. (from ὑπὸ, under, and χονδρος, cartilage.) *Hypochondria*, Auct. Lat. *Morbus Flatuosus*, Diocles and Aëtius. *Malum Hypochondriacum*, Galen, Hoffmann. *Morbus Hypochondriacus*, Fracastori. *Morbus Resiccatorius*; *Morbus Ructuosus*; *Passio* vel *Affectio*, vel *Melancholia*, *Hypochondriaca*, Auct. var. *Mater Scorbuti*, de Barbette. *Hypochondriasis*, Sauvages, Linnæus, Cullen. *Hallucinatio Hypochondriasis*, Crichton. *Alusio Hypochondriasis*, Good. *Dyspepsia Hypochondriasis*, Young; *Hypochondrie Maladie Imaginaire*, Fr. *Die Hypochondrie*, *Grillenkrankheit*, Germ. *Ipochrondia*, Ital. *Neuropathy*, I. M. Gully. *Hypochondrism*, *Hyp. Vapours*, *Hypochondriasis*, *Low Spirits*, *Hypochondriac Passion*, *Nervousness.*

CLASSIF.—2. *Class*, Nervous Diseases; 2. *Order*, from want of vital power (*Cullen*). 4. *Class*, Diseases of the Nervous Function; 1. *Order*, Affecting the Intellect (*Good*). I. CLASS, IV. ORDER (*Author*, in *Preface*).

1. DEFIN.—*Chronic indigestion with langour, flatulency, dejection of mind and fear, arising from inadequate causes; general exaltation of sensibility; a rapid succession of morbid phenomena, simulating numerous diseases, or otherwise a real, but variable state of suffering, exaggerated by the morbid sensibility and fears of the patient, with unsteadiness or variability of purpose, and distressing anxiety respecting his complaints.*

2. *Hypochondriasis* has been very differently arranged by nosological writers. VOGEL placed it amongst spasmodic diseases, and CULLEN, much more correctly, in that order of nervous complaints which depend upon defective vital power. SAUVAGES, LINNÆUS, PINEL, and GOOD have included it in the class of mental affections, and viewed it as nearly allied to insanity. I agree with Dr. PRICHARD in considering the arrangement of these latter writers not to be justified by the history of the disease, and for reasons that will be stated under the head of *Diagnosis.*

3. I. DESCRIPTION and HISTORY.—*A.* The *first*, or *slightest degree*, or *stage* of this malady, is generally confined to disorder of the digestive organs; its invasion and progress being commonly slow. However, in a very few instances, its attack is sudden, and its course more rapid. The disorder of the digestive organs is always real, although more or less exaggerated, and attended by a sentiment of general uneasiness or distress, referrible to an increased susceptibility, or morbid sensibility, especially of the organic nervous system. The appetite is sometimes not affected, but it is occasionally variable or deficient, or even excessive. Digestion is slow and difficult, and the patient complains of pain, oppression, or distention in the stomach, or hypochondres after a meal. These sensations are attended and aggravated by flatulency, and borborygmi, and sometimes by acid or acrid eructations. Occasionally the abdomen feels hard from flatulent distension, and various symptoms characteristic of chronic indigestion, as cardialgia, sense of heat in the course of the œsophagus, nausea, hemicrania, twisting or griping pains in the abdomen, &c., are complained of. In a few instances, the appetite is perverted, particularly in hypochondriacal females, or during pregnancy, a morbid desire for indigestible or the most improper substances being present. Thirst is seldom much complained of. The tongue is commonly loaded or covered, towards the root and middle especially, and particularly before breakfast, with a mucous coating. The mouth is clammy, and the taste somewhat perverted. The breath is generally offensive. The nausea is sometimes attended with a vomiting of mucous fluid, or of an acid

matter, with half digested food, and sometimes with a sort of salivation. The flatulence of the digestive canal excites, or is accompanied by, sympathetic pains in various situations, which are alleviated by eructations, and especially by the expulsion of the air downwards, but these pains usually return, although not always in the same place, or with the same characters. The bowels are generally costive, but they are occasionally irregular; constipation, with colicky pains, sometimes alternating with diarrhœa. The relaxation of the bowels seldom affords relief; and when it is prolonged, it often increases the anxiety, depression, and nervousness of the patient. The urine is occasionally natural, but it has frequently been observed by SYDENHAM, HOFFMANN, and CHEYNE, more than usually limpid and abundant. It is sometimes loaded, or deposits a copious sediment, as in dyspeptic cases. Palpitations in the heart, and in the epigastric region, are sometimes felt, and excite great uneasiness in the patient's mind.

4. *B.* The *second degree*, or *stage* of the complaint, is even still more diversified than the preceding. The symptoms already detailed continue undiminished, are often aggravated, and are accompanied by others, referrible to the brain and organs of sense, and sometimes also to the thoracic viscera. Yet, notwithstanding the severe train of symptoms, and distressing feelings of the patient, he frequently presents the appearance of sound, or even robust health. He often complains of violent pains in the temples, forehead, or occiput, or of general headache, with dimness of sight, and noises in the ears; or of a sense of weight or pressure, more intolerable than pain, at the vertex, with giddiness or confusion of mind; and sometimes of a constriction, or tightness in the head or temples, or of a morbid sensibility of the scalp, and roots of the hair. Occasionally the senses are morbidly acute and intolerant of light and noise. Pains resembling rheumatism, or those of syphilis, are felt in various situations, occasionally with a feeling of burning or heat, and sometimes with coldness, horripilations, numbness, cramps, feebleness, or threatened paralysis of one or other of the extremities. Weakness of the limbs, unsteadiness in walking, or feebleness of the joints, (in some instances, with neuralgic pains,) and great susceptibility to cold and heat, are not unfrequently also complained of. The morbid sensibility of the hypochondriac is generally increased by a cold and humid state of the atmosphere, by easterly winds, and by very warm seasons. His mind is incapable of exertion or prolonged attention, although, when aroused, he may be lively and acute; but he soon becomes engaged with his own feelings and sufferings. To these he frequently recurs in conversation, whenever he has an opportunity of doing so, although he seems to suspect that the subject is unpleasant to those who listen to him, and therefore suppresses a part of his complainings. In some cases there is dyspnœa, constriction of the chest, with a dry, short, or spasmodic cough, and occasionally a sense of suffocation or constriction is felt in the throat, with flatulence and various other symptoms resembling those attendant on hysteria. These phenomena have induced several writers to consider the disease closely allied to hysteria, and the severe palpitations, or irregular action of the heart, frequently also complained of, have further countenanced the idea; whilst they have excited the anxiety of the patient, and induced him to believe himself the subject of irremediable disease of the heart. Sleep is sometimes not materially disturbed, and occasionally the hour of repose is ardently looked for; but, in other cases, it is dreaded as aggravating the distress. Generally, as the disease advances, unquiet and distressing dreams, restlessness or insomnia, incubus and nervous agitations, are more or less complained of.

5. *C.* The *third or confirmed grade* of this malady presents nearly the same phenomena as have been detailed, but in a somewhat heightened and chronic form. The complaints of the patient have been varied, and a succession of most of those enumerated has been experienced. The patient is often tortured with the most distressing feelings, which are greatly aggravated by his fears. He dreads impending dissolution, from the symptoms referred to the head, heart, or chest. His ideas are concentrated on himself and his feelings, and he is incapable of attention or mental exertion, unless aroused by circumstances of unusual interest or moment. This mental incapacity is increased by an idea that his faculties are impaired, and by his dread to exert them. Occasionally vertigo, dimness of vision, or intolerance of light and noise, are so great as to justify his fears; and the pains in the head, or the sensations of pressure on the head and temples, are so severe, that the eyes feel as if starting from their sockets. At the same time, the organic sensibility of the digestive canal is so acute, that the progress and operation of a dose of medicine are traced by him through the different compartments, and made objects of comment. Palpitation is felt at the epigastrium, and about the cœliac axis, and is sometimes attended with sensations of throbbing, extending to the extremities. Disorder of the digestive functions still continues more or less marked, and the tongue is either loaded, or covered with a mucous coating, or is flabby at its edges. The pulse is seldom very materially affected, unless the patient be subject to palpitations, or irregular action of the heart. In this advanced, or prolonged state of the disease, the countenance of the patient often presents an air of distress or suffering. In some cases, it becomes sallow; but, in others, his appearance has no relation to the intensity of the sufferings he expresses. Whilst most of the faculties of the mind are more or less weakened, the imagination is morbidly active, and is constantly engaged with the consequences or results of the disease, of which he believes himself the subject. His desire and hopes of recovery, however, prevent him from being weary of life, or from entertaining an idea of terminating it. On the contrary, he is most anxious to obtain relief; but is frequently unsteady in the use of means calculated to afford it. He has recourse to a variety of opinions; and is more ready to adopt what is recommended for his restoration, than to persevere in its employment, or to continue under the direction of the physician whom he has consulted.

6. II. ASSOCIATIONS OR COMPLICATIONS. — Judicious observers, who have studied the course of this malady, will agree in believing, that the symptoms characterising it are by no means imaginary. They evidently depend upon physi-

cal disease, in connection with a morbidly exalted state of sensibility. This physical disease commences in the digestive organs, attended with morbid organic sensibility, which extends to the cerebro-spinal nervous system, thereby aggravating and multiplying the morbid phenomena. The lesions, therefore, observed in the course of the malady, whether functional or structural, can hardly be denominated complications. They are rather integral or necessary parts of the malady, rendered more prominent, however, by the distressing feelings which they excite, or with which they are associated. In addition to the functional disorder of the *stomach*, and other chylopoietic viscera, characterising this complaint, the digestive canal often presents evidence of marked irritation, amounting, in some cases, to asthenic inflammatory action, or even to structural lesion of the mucous surface. The secreting function of the *liver* is also often disordered, and symptoms of congestion or engorgement of this organ, or even of inflammatory action, may occasionally be detected; and in these affections, the *gall-bladder* and *ducts* not unfrequently participate. The *spleen* is sometimes enlarged, and occasionally in connection with disorder in the biliary apparatus. Hypochondriacs often are subject to *hæmorrhoids*, owing to local or general plethora, or to costiveness, or to the use of irritating cathartics. This connection has been noticed by HIPPOCRATES, GALEN, STAHL, HOFFMANN, ALBERTI, HIGHMORE, and others, and has been considered as being salutary in plethoric hypochondriacs, and when the hæmorrhoidal flux has not been excessive or debilitating. Some writers, particularly KOCH and BÜCHNER, have viewed the hæmorrhoids as the cause of the hypochondriasis; and I have met with cases which countenance the opinion, as well as with others which militate against it, and show that the removal of the former has increased the latter, by augmenting plethora, and disposing to affections of the brain. I was very recently consulted by a gentleman, who had been subject to hæmorrhoids and hypochondriasis, in its slighter form, the discharge from the former always relieving the latter for a time. The hæmorrhoidal affection was cured by surgical treatment; but the hypochondriasis was afterwards remarkably aggravated, and was followed by painful spasm and irritation about the sphincter. He consulted another eminent surgeon, who divided the sphincter; but the operation was succeeded by inflammation of the rectum, extending along the colon, with the usual dysenteric symptoms, fever, and the utmost distress. These having been subdued, the complaint in the rectum continued unmitigated; and the patient's hypochondriacal sufferings increased to the utmost. In this case, the local treatment, which was obviously injudicious, remarkably aggravated the disease.

7. Hypochondriasis either seldom occurs in FEMALES, or occurs only in a slight degree, as long as the catamenia continue regular; but when they are suppressed or diminished, or disappear at the natural period, it occasionally commences, or is aggravated. It may also occur in a slight form during *pregnancy*, and subside or disappear after delivery. Of this I have seen more than one instance. Pregnancy may also relieve this complaint, when the patient has been labouring under it for some time previously. *Organic disease*, or *irritation* of the *uterus*, is one of the most frequent associations of hypochondriasis in this class of patients; and it may, moreover, not be the only one in the same case.

8. The symptoms referrible to the *head* are not always dependent alone upon altered or exalted sensibility. In addition to this state, there is often also congestion, or deranged circulation in the brain; but the cerebral affection is generally consecutive upon disorder of the digestive functions, and upon increased sensibility of the organic or ganglial nervous system, even although the chief cause of the hypochondriasis has acted primarily upon the mind.

9. Hypochondriasis may be excited in the course of some organic malady, by the patient's attention being suddenly directed to the seat of disease, although his feelings and spirits had not been previously affected. This is not unusually the case with *organic affections* of the *heart*. I have seen more than one instance, where the detection of disease about the valves, or a particular examination of the heart by auscultation and percussion, led the patient to suspect what really existed; and the suspicion soon amounted in his mind to certainty, — his fears and distresses becoming even painful to the observer. The connection of hypochondriasis with the *gouty diathesis* has seldom been adverted to by writers. Yet I have met with several cases where the former has come on after the suppression or disappearance of gout. In such cases, disorder of the abdominal viscera is more or less marked; and is sometimes associated with deranged circulation in the brain. Indeed, this may be said to be one of the forms of misplaced gout: hypochondriasis, when prolonged or neglected, or aggravated by injudicious treatment, may pass into *melancholy*, or even into *insanity;* but this is much more rare than is supposed. In these instances, melancholic ideas, or some single delusion, is entertained, whilst the primary disorder either continues unchanged, or is partially absorbed in the superinduced malady.

10. III. DURATION AND TERMINATIONS. — *a.* The *duration* and *progress* of hypochondriasis are most indefinite. The accession of it is generally gradual and imperceptible, unless when caused by some overpowering impression or mental emotion. When judiciously treated, in its slighter forms, or during early periods, this complaint may be removed after a comparatively short time; but, otherwise, it may continue for years, with various mutations, and with indefinite periods of relief or exacerbation, depending partly upon the permanence of the causes, on the state of the season, or the occupations and amusements of the patient, or upon whatever may affect his general health and constitutional powers. It may even spontaneously cease for a time, and return again and again; or it may continue through life, without apparently shortening its duration: but, more frequently, the functional, or structural, lesion producing it gradually increases, until visceral disease of a very obvious kind is developed, and shortens existence, under the care of some practitioner who, most probably, had not witnessed the earlier progress of the malady.

11. *b.* The *terminations* of hypochondriasis are —1st, in the restoration of health by medical treatment; —2dly, by critical evacuations and spontaneous recovery; —3dly, in the develope-

ment or supervention of organic or fatal visceral disease. *a.* The *first* of these can be accomplished only slowly, and by judicious recourse to medicine, regimen, and moral discipline. *b. Critical evacuations* are rarely observed. *Diarrhœa,* particularly when caused by a copious secretion of bile, and followed by a resolution of hepatic engorgement or biliary obstruction, occasionally affords some relief; but it rarely removes the complaint, unless it be aided by additional means. The same remark applies equally to *hæmorrhagic discharges.* They furnish, however, indications of what should constitute, at least, a portion of the treatment in many cases. The spontaneous appearance of *cutaneous eruptions* has been noticed by Boerhaave, Lorry, Van Swieten, Heim, and Reil, as favourable occurrences; and enlargement of the external glands had also been considered critical by Stoll, Klein, and others.

12. *c. Organic, or fatal visceral disease,* is more liable to occur in hypochondriacs than in other persons, or than is commonly supposed. The parts most frequently undergoing structural lesion are the stomach, liver, and biliary apparatus, the brain and membranes, the large bowels, the heart and large vessels, the spleen, pancreas, uterus, and kidneys. Functional disorder of some one of these, in connection with derangement of its circulation, and with exalted organic sensibility and nervous susceptibility, most probably gives origin to most of the patient's sufferings; and as these disorders proceed onwards to organic lesion, the malady advances, until this lesion is expressed by signs, much less equivocal than those attending the earlier stages of the hypochondriacal affection. Insane delusions, melancholy, palsy, or epilepsy, may thus supervene from progressive structural change; but the former of these are by no means so common as generally believed. Palsy is a not frequent, and epilepsy is a comparatively rare, termination of this malady. Organic lesions of the heart and pericardium, as well as of the large bowels and urinary organs, are, however, oftener observed than has been supposed. The structural changes, met with in advanced or old cases of hypochondriasis, are chiefly the following.

13. IV. Lesions of Structure. — Various changes have been observed in the *digestive mucous surface,* the most important of which have been congestion, partial softening, discoloured spots, and slight ecchymoses. Thickening of the coats and induration, or an incipient state of schirrus of the pylorus, or cardiac orifice of the *stomach,* (Bonet, &c.) have been more rarely met with. The *liver* has presented various lesions, the chief of which have been congestion, enlargement of the organ, and dilatation and engorgement of the vena portæ (Lieutaud). I have found the *hepatic ducts* and *gall bladder* distended, enlarged, and filled with dark inspissated bile. Gall stones have also been found in the bladder and ducts. Alterations of the *spleen* have been observed by Bonet and others, and of the *pancreas* by Brandis. The *large bowels,* especially the sigmoid flexure of the *colon,* the *cæcum* and *rectum,* frequently present changes similar to those noticed with reference to the digestive mucous surface generally, or are thickened, or somewhat contracted; and the colour is sometimes displaced. Hæmorrhoidal tumours are often met with. A plethoric, engorged, or congested state of the abdominal viscera generally, has been remarked by Theden, Burggrau, and Leuthner. I have found calculi in the *kidneys* in one instance, and enlargement of the prostate gland and disease of the *bladder* in another. Alterations of the *uterus* have been noticed by some writers; and I believe that they are not rare in connection with hypochondriasis, especially after the change of life.

14. Organic disease of the *heart* and *large blood-vessels* is not unfrequent in hypochondriacs; but instances in which the structure and orifices and valves of this organ have been accurately examined after their death are remarkably rare. It is not improbable that some of the changes observed as a consequence of internal carditis, and of chronic inflammation of the large vessels, would be detected in some cases, if a careful inspection after death were instituted in persons who had been subject to this complaint. A plethoric state of the vascular system generally has been remarked by Winneke, and a very dark and altered state of the *blood,* by Thilenius and Burggrau. Various lesions have been found in the *brain* and its *membranes,* particularly in cases wherein the patient's chief suffering had been referred to the head; but these lesions have either been very different, in different cases, or very imperfectly described; whilst, in some, little or no alteration has been detected. In short, the bodies of hypochondriacs have presented lesions as diversified as the complaints made during life; but these lesions have been very frequently overlooked, or no inquiry after them has been made, owing to the circumstance of the complaints of this class of patients having been very generally viewed as entirely imaginative.

15. V. Diagnosis. — The diagnosis of hypochondriasis is most difficult; for the complaints of the patient are so distressing, and his sufferings apparently so extreme, that the inexperienced practitioner may be deceived by them, and believe them to proceed from dangerous states of disease, and to require the most energetic remedies. This simulation of organic and serious maladies, if it be not detected, may lead to a mischievous treatment. On the other hand, when a patient is known to be the subject of hypochondriasis, the circumstance ought not to induce us to overlook, or to treat carelessly, his sufferings, which are generally not only real, but also often depending upon structural changes, although these changes are either too obscure or too minute to be readily or easily detected. The versatility and mutations of the hypochondriac's sufferings, and the inconsistency observable between his complaints and his appearance, and between the local and general, or constitutional symptoms, will readily suggest the nature of the disease. Yet the symptoms sometimes continue without change; and the patient often makes the same complaint. In such cases, there is reason to believe that real disease exists, although exaggerated by his morbid sensibility and fears, by his imagination having long been engaged with his sensations in the seat of disorder. The want of relation between his feelings and constitutional symptoms ought also not to be too much relied upon; for, in hypochondriacs, the vascular system is not readily excited to febrile commotion, although the sensi-

bility is easily deranged and altered in a variety of situations, either successively or simultaneously. In every instance, there is the utmost necessity for patient investigation, and for the exertion of practical acumen. When the hypochondriac's sufferings are seated in the digestive organs, then a careful examination of the abdominal regions, and of the excretions, will generally indicate the extent of mischief, and show how much may be attributed to the patient's susceptibility or morbid sensibility; but when the complaints are referred to the head or heart, then the difficulty is greater; for we know that in these situations, structural changes may be slowly advancing, without inducing those physical signs and disorders of the functions of these organs, usually attendant upon more rapidly developed organic lesions.

16. The sufferings referred to the *digestive organs* have been imputed by Broussais and his followers to *gastro-enteritis*; and I believe that, in many cases, the circulation in the digestive mucous surface is more or less deranged: but this derangement is not identical with true inflammatory action. The organic sensibility and state of nervous influence in these parts are not the same in these complaints. In hypochondriasis, the patient can bear firm and prolonged pressure, although he may wince from a momentary or slight pressure, owing to his fears and morbid feelings. He generally has an unimpaired, or even a ravenous, appetite; is capable of using exercise, or even of undergoing fatigue, and is benefited by them. His bowels are usually costive, and his appearance is not materially, if at all, affected; and febrile symptoms are not observed. Whereas, in gastro-enteritis, firm pressure is generally not endured, the appetite is impaired, as well as the looks, strength, flesh and general health; and the bowels are loose and irritable, alalthough the converse of this is sometimes observed. The spongy condition of the gums, the falling of them from the teeth, and the flabby state of the sides of the tongue, frequently observed in hypochondriasis, indicate rather a deficiency of tone and of vital cohesion of the digestive mucous surface, than inflammatory action.

17. The symptoms referrible to the *head* are often such as to rouse the anxiety of the practitioner, especially when they are attended by disorder of any of the functions of sense. Yet I believe that these symptoms more frequently depend upon disordered circulation, as well as altered sensibility, than is supposed. In this complaint, the state of the cerebral circulation is too often neglected, or not inquired into; and the sufferings of the patient believed to be either exaggerated or imagined. When his strength and healthy appearance are unimpaired, and the functions of the senses are uninjured; and when the temperature of the scalp and the action of the carotids are not materially affected, we may safely conclude, that the morbid feelings in the head do not indicate that danger, which the fears of the patient would imply; and this inference will be the more conclusive, if the patient have never experienced any apoplectic, paralytic, or epileptic seizure; and if he has been known to be subject to nervousness, low spirits, or hypochondriacal feelings. In many cases, however, of this malady, particularly in the second or third grades of it, increased action of the carotids, heat of the scalp, flushing of the countenance, suffusion of the eyes, &c., indicate cerebral plethora, or active congestion within the head, and sufficiently show that, although the sensations in this quarter may be exaggerated, they are by no means unreal.

18. The disorders referred to the *heart* and *lungs* are to be distinguished from such as are unequivocally organic, by attention to the physical signs. The palpitations and anxiety at the præcordia often complained of, are certainly chiefly nervous in their nature; but of this we have only negative proof. During the palpitation, a bellows-sound may be present, although it cannot be detected in the intervals. Yet I have known instances where it was at first heard only during the paroxysm of palpitation; but, after the lapse of a long period, it was heard more constantly. I believe that those distressing symptoms, although strictly nervous at early periods of the disease, either slowy or imperceptibly induce, or are attended from the beginning with, a slight and gradually increasing kind of organic lesion. Morbid states of the heart, as slow grades of inflammatory irritation, may exist, especially in the lining membrane of the cavities and large vessels, and occasion the distressing feelings complained of, although they may not be manifested by physical signs. When cough, and difficult or oppressed breathing, are present, their nervous or sympathetic nature may be readily determined by attention to their characters, by the absence or the appearance of expectoration, and by the signs furnished by auscultation and percussion.

19. Hypochondriasis has been often confounded with, or viewed as a variety of, *insanity*. It is important to discriminate between them. Dr. Prichard's remarks on this subject evince the correct judgment of this able writer. He observes, that an hypochondriac is in full possession of his reason, though his sufferings are not so dangerous, or so severe as he supposes them to be; but if he declares that his head or his nose has become too large to pass through a doorway, or displays any other hallucination, he has become a lunatic; his disorder has changed its nature; and this conversion takes place occasionally, though by no means so frequently as supposed. Hypochondriacs, however low-spirited or dejected, also suffer differently from persons affected with *melancholy*. The apprehensions of the former are confined to their own feelings and bodily health. On other subjects, they converse cheerfully, rationally and justly. But melancholics view all things through a gloomy medium. They despond on all subjects, and are mentally miserable, and independently of any severe bodily suffering. The affections and sentiments of the hypochondriac, especially to his former friends or to his connections, are not in the unnatural, or perverted state, observed in all the forms of insanity.

20. VI. Causes. — i. *Predisposing circumstances.* Hypochondriasis may commence at any age; from 21 to 55 in males, and from 30 to 60 in females. It is more frequent and more severe in the former than in the latter sex. It seldom occurs in females until after 30 or 35, hysteria being the form which nervous affections usually assume in them in early life; but it often commences about or soon after the cessation of the menstrual discharge, although rarely in so severe a form as in the other sex. It affects every

temperament or habit of body; but somewhat oftener the nervous, the melancholic, the sanguine and the bilious; and persons who are subject to hæmorrhoids, to constipation of the bowels, and to disorder of the digestive functions, and who are of a sallow complexion. Hereditary influence, or peculiarity of constitution transmitted from the parents, has, perhaps, some influence in predisposing to it, as WILLIS, HOFFMANN, and others have contended, although not in so remarkable a manner as in some other nervous complaints. Employments which are sedentary, or prevent due exercise in the open air, and which, at the same time, admit of activity of mind, also predispose to this complaint. Hence the frequency of hypochondriasis in shoemakers and tailors. Mental exertion and fatigue, or prolonged or overstrained attention and devotion to a particular subject, especially in connection with full living relatively to the exercise taken in the open air, may be said to be the chief sources of predisposition amongst the educated classes. Owing to these circumstances, this has been termed the disorder of literary men; but whoever is engaged in active mental pursuits, or in departments of business requiring great intellectual exertion, or occasioning anxiety of mind, is equally liable to it. Dr. PRICHARD observes, that agricultural labourers, who spend a great portion of their time in solitary employment in the country, are frequently the subjects of this complaint. Although solitary employment is likely to dispose the mind to brood over the evils that afflict it, yet much is probably also owing to the diet of field labourers, and to the influence of humidity and exhalations from the soil to which they are exposed, particularly in the reparation of ditches and hedges. The effect of climate in predisposing to hypochondriasis is not very manifest; but situations which are humid, and productive of terrestrial emanations, are apparently not without some influence in the production of it.

21. ii. *The exciting causes* may be divided into (*a*) those which act more immediately upon the mind, and consecutively, or through the medium of the mind, upon the organic functions; and (*b*) those which affect primarily those functions, and secondarily the mental energies. — *a.* Whatever exhausts, or directly depresses cerebral power, as intense application of the mind to difficult or abstract subjects, anxieties respecting schemes, speculations, or objects of ambition; disappointments, sorrow, fright, or sudden alarm; the depressing passions, severe losses of fortune or friends, indulgence of sombre or sad feelings; devotion to music and the fine arts, reading medical books, &c., and whatever favours congestion of the brain, as indulgences in bed, the use of narcotics, particularly opium, &c., may occasion this complaint.

22. *b.* The causes which act primarily upon the organic nervous system, and functions of the organic viscera are very diversified. Whatever impairs the energy of the system, as the too frequent or too liberal use of calomel as a purgative, or of other mercurials; poor, or innutritious diet, or the excessive use of tea and slops; a humid, close, impure, or miasmatous air, &c., may produce hypochondriasis. Mercurial purgatives, although often serviceable by promoting the discharge of bile, and giving relief for a time, yet often increase the nervous depression and morbid sensibility, when frequently resorted to, and induce or aggravate this complaint. Of the origin of hypochondriasis in an improper recourse to calomel, I have seen several instances. Whatever inordinately excites, or directly relaxes, the digestive mucous surface, as acrid cathartics, often exhibited, &c.; whatever occasions or perpetuates indigestion, or impedes the functions of secretion and excretion; and whatever occasions plethora of the vascular system generally, or of the portal or cerebral vessels in particular, especially overloading the digestive organs by too large meals, or by too rich or full living, the inordinate use of animal food, of malt liquors, wine, &c.; insufficient exercise, and inattention to the several excreting functions, may give rise to hypochondriasis. Whatever induces torpor, or perpetuates inaction of the depurating organs, whilst the organs of supply are stimulated to increased activity, will occasion redundancy of noxious elements, or of the ultimate products of animalisation, in the blood, and will, sooner or later, especially in connection with vascular plethora, give rise to this complaint, or to some other, depending, equally with it, upon oppletion of the vascular system. Persons who have been accustomed to active occupation, both physical and mental, or to much exercise in the open air, upon retiring from business with a competency, and when hoping to enjoy the fruits of industry, are often overtaken by this complaint, particularly if they live fully, and in a comparative state of ease and indolence. The vascular system, which was formerly preserved in a state of fulness, in due relation to nervous power, by the healthy action the different emunctories, now becomes overloaded, particularly the portal vessels. The cerebral circulation also becomes oppressed, and the mental energy impaired.

23. *c.* Some of the causes act by weakening both the organic nervous influence and the mind. The most injurious of these are premature and excessive sexual indulgences, particularly masturbation. Whenever hypochondriasis appears early in life, this should be dreaded as having been the chief cause. Many of the depressing passions, and anxiety of mind, act in a similar manner. As the early addiction to vicious habits, as well as several others of the exciting causes, is more or less frequent in all classes of the community, it cannot be said that the effect is confined to any particular class. Indeed, hypochondriasis is often met with in the lower orders, although not so frequently as in those whose minds are most highly cultivated, whose sensibilities are thereby rendered acute, and who are either precluded from, or not obliged to take, that exercise which is necessary to prevent general, local, or excrementitious plethora.

24. VII. PATHOLOGY. The ancients appear to have observed this complaint chiefly amongst philosophers, poets, and others endowed with the most acute sensibility, and the most vivid imagination; and to have either confounded it with, or viewed it as a variety of, melancholy. ARISTOTLE says, that all the great men of his time were melancholic, that is, hypochondriac. HIPPOCRATES, ARETÆUS, and others, attribute the complaint to an excess of black bile. DIOCLES refers it to the stomach, and GALEN considers it as a variety of melancholy, having its origin in this

organ. However much the ancients and older writers differ, as to whether it should be considered as a dyspeptic, or as a mental affection, they appear not to view it as connected with hysteria. SYDENHAM, however, describes hypochondriasis and hysteria as the same affection; without taking into account the chronic inflammations, obstructions, or lesions of structure so often associated with the former, and refers them to deficiency or irregularity of the animal spirits, — of the cerebro-spinal nervous influence, in the language of modern pathology. WILLIS considers it as a nervous complaint, seated in the brain; and ZACUTUS LUSITANUS, as an affection of the stomach and liver, depending upon coldness of the former and increased heat of the latter. BOERHAAVE thinks that it depends upon a viscid matter engorging the vessels of the organs seated in the hypochondria, as the liver, the spleen, stomach, pancreas, and the mesentery. STAHL and his followers suppose it to arise from efforts to establish a critical hæmorrhage; LOWER, from a morbid disposition in the mass of blood; and HOFFMANN, from too great a tension of the nervous system, sometimes in connection with inflammation of the digestive mucous membrane. From the time of HOFFMANN until that of CULLEN, various modifications and absurd combinations of the preceding opinions have been advanced. CULLEN observes, that this disorder occurs chiefly in persons of a melancholic temperament; that it consists of an affection of the mind, conjoined with dyspepsia, and is the result of a weak and mobile state of the nervous power. The opinions of CRICHTON and GOOD are deficient in precision and accuracy; they have confounded with hypochondriasis affections entirely distinct from it and from one another. LOUYER-VILLERMAY has formed more correct views of its nature and relations than most modern authors. He concludes that it is seated in the abdominal viscera, particularly in the stomach, and that these are affected in their nervous system or their vital properties, and especially in their organic sensibility. He conceives the disorder to consist in an alteration of the vital properties of the nerves of digestion, and an exalted state of organic sensibility, of which these nerves are the special conductors and receptacles. At the same time, he admits that the general sensibility and the cerebral functions become consecutively affected. This opinion is essentially the same as that of BICHAT; and it has been adopted by the author, and, more recently, by M. BRACHET and Dr. GULLY. M. BROUSSAIS contends that hypochondriasis is not merely a nervous affection, but that it is a result of chronic inflammation of the digestive mucous membrane; the morbid sensibility distinguishing it arising from the peculiar condition of this membrane, as respects its vascularity; and that the various ailments of which the hypochondriac complains proceeds from sympathy with this part of the digestive canal.

25. M. GEORGET argues, on the contrary, that the disease is primarily seated in the brain; that it is characterised by disorder of the functions of this part, unaccompanied by fever, or convulsive motion, or any manifest derangement of reason or judgment, and he adduces the following circumstances in support of his argument. 1. That the chief exciting causes of the disease exert their influence directly on the functions of the brain. 2. That the characteristic symptoms are referrible to the head. 3. That other symptoms observed in the complaint are not constant, some belonging to one organ, and others to another, whilst the digestive functions are occasionally not disordered. 4. That moral treatment is the most efficacious in the complaint.—There are several fallacies in the above inferences: It by no means follows, that, because certain occurrences make their first impression on the mind, the brain should be either principally or primarily affected by them. The depressing passions, however excited, produce a much more remarkable effect upon the functions, and even upon the organisation, of the heart, the stomach, the liver, &c., than upon the brain itself, unless indeed this last organ has previously been in a state of disease. The early symptoms, also, of hypochondriasis, are certainly not so referrible to the brain, as to the digestive and other organs, supplied by the ganglial class of nerves; and moral treatment is not always the most successful, or that which should be alone put in practice: it more generally constitutes only a part of a general plan.

26. Dr. PRICHARD observes that, when we take into consideration the mental dejection of hypochondriacs, the habitual state of their spirits, and the trains of morbid or painful sensations which torment them, we must admit that some deviation from the healthy state of the cerebral functions lies at the foundation of their ailments, though it is remote from organic disease, and of a kind of which we can form no conception. Many of the phenomena, he allows, would lead to the opinion, that the principal deviation from the natural state of functions, is seated in the nervous system of physical or organic life; but, phenomena involving consciousness and affections of mind, can hardly be confined to this part of the nervous system. Dr. PRICHARD, however, overlooks the fact, that the brain itself is as much supplied with the organic nervous system, as any other internal organ, and consequently that it will manifest disorder, whenever this part of the nervous system is seriously affected; and that this disorder will present similar characters as to kind — as to depression, perversion, activity or exaltation — to those displayed by other organs influenced by this system. The complaint, it is admitted, commences, or is first manifested, in the digestive viscera; and, it is not until the organic nervous system evinces great depression throughout the abdominal organs, that the functions of the brain become also manifestly depressed or impaired, and then the depression observed in the energies of these functions is similar in kind to that remarked in the digestive, secreting, and excreting actions; — these latter are performed slowly and imperfectly, — intellectual power, attention and application are also weakened. The sensibility of the organic nervous system, is morbidly acute in all or several of the viscera, — the cerebro-spinal system, and the dependent organs of sense and volition, are also morbidly susceptible, and incapable of the energetic exercise of their functions. The organic actions are performed with obscure sensations of distress, difficulty or anxiety, — the mental operations are attended by fear, distrust, and anxious bodings. The vital manifestations throughout the economy

are languid and relaxed, and the resistance opposed by life to morbid impressions remarkably weakened, — the faculties of the mind are equally languid, and the tone of the cerebro-spinal nervous system altogether depressed. Dr. PRICHARD supposes, that the occasional suspension of the complaint, for longer or shorter intervals of time, militates against the opinion, that the disease is owing to the state of the organic, nervous, and digestive functions; but this part of the nervous system is as likely to experience remissions and exacerbations of disorder as the brain and its dependencies. At the commencement, the affection of the organic or ganglial nervous system is confined chiefly to the digestive and excreting organs; but at a more advanced stage, it is extended to the brain, where it occasions the dejection of spirits, the fears, and the anxieties connected with the patient's feelings and ailments, characterising the fully developed complaint.

27. My views will be partly apparent from what has been now advanced. But, although the organic nervous system is evidently primarily and chiefly affected in hypochondriasis, and although the brain thus becomes consecutively implicated, other morbid conditions are also superinduced, and are more or less concerned in the aggravation or perpetuation of the patient's feelings and sufferings. Imperfect excretion compared with the supply of nourishment induces either absolute or relative plethora, as well as a morbid condition of the circulating fluids, owing to the accumulation of noxious matters—alimentary, saline, and animal — products of animalisation, which have not been eliminated from the blood. The chief vital organs thus become loaded and oppressed; and the nervous system and brain are rendered morbidly susceptible by the quality of the blood circulating in them. From considerable experience and close observation of the circumstances connected with the pathology and treatment of this complaint, I am firmly persuaded that these views constitute the only basis of a successful method of cure.

28. VIII. — PROGNOSIS. It is often extremely difficult to form an opinion, as to the presence of danger in this complaint. Even where the sufferings have been most distressing, the patient's life has apparently not been materially shortened thereby; and where they have been much slighter, death has occurred unexpectedly, and whilst the symptoms did not seem to indicate its approach. This may have been owing in part to the want of discrimination on the part of the practitioner, in not detecting organic lesion in the heart, brain, or other viscera. There can be no doubt, that many cases of obscure structural change in either of these organs, or in any other part, were formerly considered as hypochondriasis, and most injudiciously treated as such. Many of these would have been detected by the improved diagnosis of the present day, and thus the number of instances of the disease would have been diminished. Yet nevertheless, the existence of this complaint, or, in other words, of an affection of the functions and sensibility of the organic, and cerebro-spinal nervous systems, sometimes associated with, and heightened by, structural lesions, cannot be doubted; although M. FOVILLE has contended that it should not be considered as anything else than organic change in persons of acute sensibility; that both it, hysteria, irregular gout, and disorders of the fluids, belong to the same category; and that to one or other of these, the ignorant part of the profession refer those complaints, the true seats and natures of which they are unable to detect, — that, in short, they are names under which all others but the morbid anatomists conceal their ignorance. Now it may be stated without much fear of injustice, that those who see nothing in disease, but what is demonstrable after death, and who believe in nothing pathological, which is not material and palpable, will very often arrive at wrong conclusions, as to the origin, nature, course, and treatment of the most important maladies of our species.

29. The *Prognosis*, however, relates more to the probable recovery of the patient than to any danger more or less immediately attending it. Of the existence of danger, the signs of organic change will be the chief harbingers, and upon the detection of these, and upon the inferences formed as to the seat and nature of existing lesion, the opinion will necessarily depend. — *a.* The circumstances, which may be considered as *unfavourable* to the patient's complete recovery, are not always very manifest or readily ascertained; but, if the causes are not removable, or chiefly of a moral kind, — if the disease is confirmed, or if the patient has had repeated attacks, — if it has supervened upon the suppression of the hæmorrhoidal flux, and is not removed by the restoration of this evacuation, or upon the disappearance of the catamenia at the usual period, — if sleep is not obtained without recourse to narcotics, — if the imagination is powerfully affected, and constantly influenced by moral causes, the physical indications of disease being slight, — if the nervous affection is associated with serious disorder, or with signs of structural change of some important viscus or with some mental delusion, — and if the patient indicates much suffering in his appearance, or the melancholic temperament, or a cachectic habit of body, — we may expect to alleviate, but we can hardly hope to remove, the malady, although the removal of it may be accomplished.

b. A more favourable opinion may be entertained, if the chief ascertained causes are removable; if the disease is recent, or only in the first or second stage; if the patient is of a sanguine temperament; if the circumstances or profession of the patient admit of exercise, or salutary employment of mind or body, and of travelling, or repeated change of air during the treatment; if he enjoys his nightly repose, and possesses his usual or natural looks; if the test of BAGLIVI — "In chronicis morbis si facies naturalis sit, ac boni coloris, nunquam crede adesse obstructiones, aliaque vitia in visceribus" — is applicable, and if the unfavourable circumstances enumerated above are not present. — Hypochondriasis has been removed by the supervention of other diseases, as diarrhœa, dysentery, fever, jaundice, dropsy, &c.

30. IX. — TREATMENT. Hypochondriasis would be more frequently cured, if stricter attention were paid to the removal of the circumstances in which it originated, and to the combination of physical and moral treatment appropriately to the pathological states just considered. But the disease is generally advanced or confirmed, before proper medical advice is resorted to, — the patient has been for some time exciting his imagination,

and aggravating his morbid sensations by reading medical works, which might mystify but could not instruct him as to his ailments, and dabbling in physic, which might confirm, but could rarely relieve, his complaints; — he fails in his own efforts, and then, if he have recourse to a duly qualified adviser, he expects, and is impatient if he does not derive, immediate benefit. Many hypochondriacs also adopt neither the restricted diet, nor the regimen prescribed for them; and thus the treatment fails more from the fault of the patient, than from the means employed.

31. i. *The first indication*, in the treatment of hypochondriasis, is *to remove the remote causes, the habits, circumstances, and moral influences, to which the patient has been, or is subjected.* The *diet* should be restricted, and regulated with reference to the patient's habits, occupations, and daily amount of exercise; and he ought to be engaged, as much as possible, with objects calculated to interest, but not to fatigue, the mind. With the affluent this is a matter of difficulty, and is often only to be accomplished by travelling. In the good old monkish days, pilgrimages to the shrines of saints were recommended for the benefit both of soul and body; but in modern times, since these have become divided cures, saintly interference has been but little confided in, and the purifying operation of mineral springs has alone been considered efficacious. And, certainly, the good effects resulting from faith in either, or in both these agents, have neither been few nor equivocal. The shrewd practitioner, who plants himself by the side of a saline or chalybeate mineral spring, or any other spring possessing deobstruent and tonic properties, and situated in a dry and salubrious air, if he succeed in attracting hypochondriacs to his Hygeian temple, by the usual direct or indirect means, will generally relieve many of the more faithful of his worshippers. The lawyer, the merchant, the stockbroker, and others, who have weakened their digestive organs, exhausted their nervous systems, and over-excited or tortured their brains, by application to business, by the vicissitudes of affairs, and the anxieties which are consequent thereon, when induced to visit a watering place, will frequently derive benefit from the moral and physical changes thereby occasioned. Instead of over-exciting or distracting the mind with business, of overloading, and perhaps over-stimulating the digestive organs, of allowing the liver and bowels to become torpid, of neglecting due exercise in the open air, and of respiring the impure atmosphere of a crowded city or manufacturing town, the hypochondriac is properly directed to relinquish the anxieties of affairs, to conform to a limited diet, to keep his bowels very freely open, to walk and ride a certain number of miles daily at prescribed times, and to drink the waters, whether aperient, deobstruent, or chalybeate. The result cannot be doubtful in many cases. The entire removal of the causes of disorder, the exercise, the change to a purer air — the thorough alteration of habits, of circumstances, and of atmosphere — all combine to produce benefit; and the physician, as well as the spring, obtains a credit, to which the amount of merit really possessed by either by no means entitles them, and which is often heightened by the circumstance of advice previously given to the patient — whilst he is immersed in business and distracted by anxieties, when precluded from exercise and amusement, and when constantly subjected to the combined operation of the causes of the malady — having failed in accomplishing what was probably most judiciously attempted, but which he was counteracting in the most efficient manner in his power.

32. The best means of fulfilling this indication is by *travelling*, and by due *attention to the diet, and to the excreting functions.* Continued residence at a single watering place is not nearly so beneficial as travelling, unless much exercise be daily taken. Travelling, aided by mineral waters suited to the peculiarities of the case, has the best effect; and, next to this plan, judicious medical treatment, pursued at the same time with change of air and scene. The very incidents connected with travelling, as Dr. Prichard remarks, abstract the patient's attention from his feelings and sufferings; and, even the temporary disorders that may occur, as rheumatism, cold, and diarrhœa, produce this effect in a still more remarkable manner. When mineral waters are resorted to, either alone, or in connection with travelling, those which are aperient and deobstruent should be first used, as the waters of *Seidschutz*, or *Pullna*, or *Cheltenham*, or *Harrowgate*, &c.; and subsequently those of *Bath*, *Carlsbad*, or *Marienbad*, *Pyrmont*, or *Tunbridge*, &c. The springs of *Schwalbach* and *Pyrmont* were much extolled by Hoffmann; those of *Eger* and *Marienbad*, by Heister and Hufeland; and the waters of *Pyrmont* and *Seltzer*, by Marcard. The baths of *Wiesbaden* have also been praised by Ritter and others. During a course of Chalybeate waters, the bowels ought to be kept moderately open, either by aperient medicines, or by the more aperient or purgative waters. Exercise of all kinds is more or less beneficial; but that on horseback, or on foot, or both, is perhaps preferable. The former was much praised by Sydenham and Fuller; but, whatever kind of exercise be adopted, it is necessary to regulate the bowels, to promote the functions of the emunctories, to remove the patient from the pursuits, anxieties, and circumstances, which induced the complaint, or to change his habits, and to amuse and interest his mind.

33. ii. *The second indication is to evacuate morbid secretions and accumulated excretions, to correct the morbid states of the digestive canal, and of the organs immediately connected with it, and to relieve the more distressing feelings of the patient.* It is indispensable to the obtaining of the confidence of the patient, and, consequently to the successful management of his case, that his various ailments should be attentively heard and patiently investigated; that they should be altogether viewed as real, and that the treatment should be prescribed for him with clearness and with decision. However much the practitioner may doubt as to the origin or nature of the complaint, and however much he may despair of the efficacy of the means prescribed, he should conceal his doubts, treat the sufferings and feelings of the patient with sympathy, and arrange and combine the means of cure into a method at once consistent and appropriate, which is to be faithfully pursued in all its parts. Confidence will be thus inspired, without which he will neither derive benefit nor continue under treatment.

34. *a.* The propriety of having recourse to *mild* or *stomachic* purgatives, when the bowels are sluggish or torpid, or the stools offensive, cannot be questioned. Yet, in some cases, the *gastro-intestinal mucous surface* may be in such a state of irritation or of chronic inflammation, as to require these to be prescribed with caution, and selected with judgment. When this state of the digestive mucous surface is present, *leeches* should be applied to the abdomen, or to the anus: *refrigerants* should also be given with *mucilaginous* or *emollient medicines*, (F. 355. 431. 436. 821. 837. 865.) and the functions of the skin promoted by the *warm* or *vapour bath*. If the patient be plethoric, a moderate *venesection* or *cupping* on the nape of the neck, or a repetition of leeches to the epigastrium or anus, will be of service. Although irritating purgatives are hurtful in this description of cases, yet those of a mild or of a cooling kind ought not to be withheld; and their operation may be promoted by enemata. The tartrate or sulphate of potash, the carbonate of soda or magnesia with rhubarb, either in powder or infusion; or the phosphate of soda, or the tartrate of potash and soda, may be given with other substances, (F. 440, 441. 868.) according to the peculiarities of the case. The *diet* should be restricted chiefly to mucilaginous or farinaceous articles, and the beverages consist of simple saline or cooling fluids.

35. In other cases, particularly where the digestive mucous surface is deficient in tone, and when the states of the epigastrium, of the pulse, and of the tongue do not indicate inflammatory irritation, *purgatives* or *aperients* of a warmer or more stomachic kind than the above may be prescribed. The infusion of senna, or that of rhubarb, may be given with the infusion of gentian or of columba, or of cinchona, or of cascarilla, and an aromatic or carminative tincture and a neutral salt: or the aperients directed above (§ 34.) may be taken in mint-water. In many cases the compound *galbanum pill*, or *assafœtida*, may be conjoined with the purified *extract of aloes*, or with *rhubarb*, and the inspissated *ox-gall* (See F. 547, 548. 558—563. 572—576.), either at night, or daily with dinner. I have found the following excellent in hypochondriasis with a torpid state of the large bowels.

No. 259. ℞ Pulv. Rhei ʒ ss.; Pulv. Ipecacuanhæ, Pulv. Capsici, āā gr. vj.; Extr. Aloes purif. ℈ j.; Extr. Fellis Tauri ʒ ss.; Saponis duri, gr. xij.; Olei Carui, q. s. Contunde benè, et divide in Pilulas xxx., quarum capiat unam vel duas quotidiè cum prandio.

No. 260. ℞ Extr. Fellis Tauri, Massæ Pilul. Galb. Comp. āā ʒ ss.; Extr. Aloes purif. ℈ j.; Saponis duri, gr. x.; Pulv. Ipecacuanhæ, gr. viij. M. Fiant Pilulæ xxx. Capiat unam vel duas, ut suprà.

36. The use of *laxatives* in hypochondriasis was much insisted on by Renouart and Legier, and various substances belonging to this class were recommended: but they require no very particular remark at this place. *Magnesia*, especially the calcined, is well deserving of adoption, when the complaint is attended by a copious deposit of salts in the urine, or by a gouty diathesis. It also relieves the flatulence and distension of the epigastrium and hypochondria more certainly than any other aperient. When there is no gastro-intestinal irritation, or if this be slight only, it may be given in mint-water, or in any tonic, stomachic, or aromatic vehicle. Precipitated *sulphur* was much praised by Bisset, and is certainly an appropriate laxative, particularly as the use of it for some time increases all the excretions, and especially those from the skin, bowels and liver.

37. *b.* Many of the distressing feelings of the patient are referrible to *irritation* in some part of the digestive mucous membrane. This irritation may exist in the *rectum* in connection with hæmorrhoids, or in the *cæcum*, or in any other part of the canal: but these two are amongst its most common seats. In such cases, it is propagated by the communicating ramifications of the ganglial nerves to the roots of the spinal nerves, or to the spinal chord, and sensibly expressed in some remote part by *reflex sympathy*, as stated in my notes to Richerand's *Elements of Physiology* (p. 34. Lond. 1824. 2d ed. 1829.). The *hæmorrhoidal discharge* has been considered favourable in hypochondriasis by Alberti, Grant and others; but, as already stated (§ 6.), it indicates either general or local plethora, when it has not been induced by costiveness or by acrid purgatives, and points to restricted diet. When the hæmorrhoids are not attended by any discharge, they furnish the same indications and show that, in addition to low diet, general or local bloodletting should be prescribed. Without these, the removal of the hæmorrhoidal affection may not be entirely devoid of risk to the hypochondriac, especially if regular exercise in the open air be not taken.

38. *c.* Simple *lavemens* or *enemata* have been too generally neglected in the treatment of this complaint. The researches of Pinel, Annesley, and of the author, show that the large bowels are not only disordered in their functions, but also often altered in structure, or even displaced in the more severe and chronic cases. The depressed state of organic nervous energy, occasioning hypochondriasis, permits fæcal and flatulent accumulations to form in the *cæcum, colon* and *rectum* (see these *articles*), causing inordinate distensions of portions of the canal with spasmodic constriction of adjoining parts. Owing to the fæcal collections, to the efforts of one part of the bowel to propel its contents through a torpid or an obstructed portion, and to the frequent recurrence of these states, displacement of portions of the colon, and even partially of the cæcum, are not rare. Inordinate dilatation of the latter viscus is also sometimes observed. But I have remarked, in several cases of hypochondriasis complicated with hæmorrhoids, or with spasmodic stricture of the sphincter ani, or with fissure or some other source of irritation in the anus, a remarkable *dilatation of the rectum* within the sphincter. In these instances, the dilatation amounted to a sacculated state. This had evidently proceeded from inordinate accumulation of fæces, owing to the obstacle to their discharge, caused by internal hæmorrhoids or by spasm of the sphincter. One of these had been treated for stricture of the rectum, and a bougie frequently passed; but it seldom found its way into the portion of the bowel above the dilatation. The intestine was injured by this officious interference; peritonitis supervened; and near the fatal termination of the case I was consulted. Inspection after death furnished a striking example of this dilated state of the rectum, as well as of the effects of a species of interference generally quite unnecessary, although so frequently practised at the present day by a few

surgeons, as to render it disgusting, particularly as it is warranted neither by the history and nature of the case, nor by sound therapeutical views.

39. In the early stages of hypochondriasis, especially, and as a means of preventing costiveness and the above, as well as other consequences of this state, *enemata* of various kinds, according to the peculiarities of the case, ought to be frequently employed. Simple water, tepid or cold; emollient, oleaginous, or saponaceous fluids, and various saline solutions, will be thus administered with benefit, and will not only promote the action of the aperients just mentioned, but, when daily used, will establish a regular state of fæcal excretion. (See *the Formulæ for Enemata in the Appendix.*)

40. *d.* Whenever the complaint is connected with vascular *plethora*, or is consequent upon the suppression or disappearance of some accustomed evacuation, and when it has been fully developed, an oppressed or *congested state of brain* may exist. But whatever may be the state of circulation in the capillaries or sinuses of this organ, there can be no doubt of the propriety of a moderate *depletion*, by cupping on the nape of the neck, in these cases. I have prescribed it in several instances with marked benefit; and in one gentleman I carried the depletion to thirty ounces at a single operation with the greatest advantage. Many of the patient's distressing feelings depend upon the superinduced disorder of the circulation in the brain, particularly those which are referred to the head, and to the organs of sense and volition. In some cases, however, of this description, blood should be abstracted with caution, and it will sometimes be necessary to promote nervous energy and tone, even whilst we have recourse to depletions and evacuations. Whenever the hypochondriac has encreased heat of scalp with a firm pulse, these latter may be safely prescribed in moderation, and may be aided by cold-sponging the head night and morning, or by daily recourse to the *cold douche* or *shower-bath.* The extremities, especially the feet, of this class of patients are generally cold; this circumstance should receive due attention. When the sufferings are referrible to the brain it will be useless, and indeed sometimes injurious, to attempt to alleviate or suppress them by powerful narcotics. Even when these give temporary relief, more permanent mischief is often occasioned. The means already noticed, both regimenal and medicinal, will be much more efficacious; and, if these fail, when pushed sufficiently far, organic lesions probably exist, for which setons, issues, &c. may be tried, although with but slight prospect of advantage.

41. *e.* If the complaint is associated with *palpitations* or *irregular action of the heart*, or with a *dry nervous cough*, much benefit will result from *camphor*, conjoined with *narcotics*, and sometimes, also, with *refrigerants* and *demulcents.* A weak decoction of *Senega*, with orange-flower water, or with any other aromatic and demulcent fluid, and with small doses of *prussic acid*, or of some other anodyne, will often, also, be of service. If the *liver* be congested, or otherwise disordered, the treatment should be modified accordingly. The majority of cases of this kind, particularly if the patient have lived fully or taken little exercise, will bear *depletion*, especially cupping on the right hypochondrium, or below the right shoulder, or the application of leeches to the anus. A dose of *calomel*, or of PLUMMER's pill, or of blue pill, may also be prescribed; but it should either be conjoined with an aromatic, or some purgative, or be followed, in a few hours, by a stomachic aperient. Hypochondriacs are generally very susceptible of the specific action of mercurials, and their mental depression and nervous sensibility are much increased by them: yet, with due caution, and if not often resorted to, they are beneficial, when the functions of the liver are impaired. The supertartrate of potash, the preparation of *Taraxacum*, and the carbonates of the *alkalies*, with stomachic purgatives, are also of great service in a torpid state of this organ. When, in connection with this, or with a morbid state of the biliary and other abdominal secretions, the hypochondriac complains much of *colicky pains*, with costiveness, flatulence, distension, &c., these, and the mild purgatives already mentioned, calcined *magnesia*, with antispasmodics or carminatives, or with small doses of *ipecacuanha* and *hyoscyamus*, should be steadily employed for some time, and be aided by emollient diluents, by *demulcents*, and by *saponaceous* or *oleaginous enemata.* Castille soap may also be conjoined with the other substances, given in the form of pill.

42. iii. *The third intention is to restore the energy and healthy functions of the organic, nervous, and cerebral organs.* — *Tonics* have been too commonly prescribed prematurely in hypochondriasis, or when the digestive mucous surface, or the brain, or the liver, has not been in a state to derive benefit from them. They are even prejudicial in most of the circumstances which have now been considered, unless in combination with purgatives, especially when these parts are in a state of irritation or congestion, and until this be removed, they may even aggravate the complaint. But when the excretions have been duly promoted, appropriate evacuations procured, and visceral congestion removed, a judicious recourse to them is often of great service. During a course of tonics, the bowels should be kept regularly open, and local irritation or determination of blood prevented or removed, should either appear. The *Chalybeate mineral springs*, already mentioned (§ 32.), are especially beneficial, when tonics are indicated. The preparations of *Iron*, particularly the sulphate, the ammonio-chloride, the potassio-tartrate, and the sesqui-oxide, may be substituted, with advantage, for mineral waters; but if they occasion fever or headache, they will generally be injurious, unless conjoined with saline refrigerants. If *gastrodynia* is complained of, the tonics may be given with anodynes or narcotics, as the *Hydrocyanic acid*, *Hyoscyamus*, the compound *tincture of camphor*, &c., or with the carbonates of the *alkalies*; — the *Tris-nitrate of bismuth* may be prescribed in similar combinations. Where there is a tendency to plethora, tonics, and especially chalybeates, should not be employed, without attention be paid to exercise and diet. When tonics prove too heating, the bitter infusions or decoctions may be prescribed, with small doses of *Nitre*, or of the *Hydro-chlorate of Ammonia.*

43. When Hypochondriasis seems consequent upon venereal excesses, or upon solitary indulgences, or when the sexual appetite is increased, as is sometimes the case, tonics are more especially

indicated, and may be prescribed from the first, if the bowels be kept regularly open. In such circumstances, vascular depletion is contra-indicated, and evacuations of any kind ought to be cautiously practised. The chalybeate mineral waters, soda water, or other waters containing fixed air; the vegetable tonics, with soda; the tincture of the sesquichloride of iron, taken in camphor mixture, &c., are most appropriate in such cases, aided by early rising, and exercise in the open air.

44. iv. A *Fourth Indication* has been advised by some writers, viz. *to restore to its proper seat or form any other complaint, upon the removal or spontaneous cessation of which the hypochondriacal affection had supervened.* This intention, however, cannot be often fulfilled, for an herpetic eruption may not be restored, although an artificial eruption may be easily produced. The restoration of an hæmorrhoidal flux is more readily procured; but a judicious recourse to local depletions, and to suitable diet and regimen, will be still more beneficial. The developement of the gouty paroxysm, when hypochondriasis follows the disappearance of gout, has likewise been advised; but attempts to accomplish this do not always succeed: they may even aggravate the complaint. The means just mentioned will sometimes prove so serviceable, as to render such attempts unnecessary; and yet I have seen instances in which these means have failed, and for which I have been obliged to recommend a more liberal diet and regimen, with change of air, travelling, &c. When hypochondriasis follows periodic fevers, this indication is entirely out of the question. In these cases, as well as in those produced by malaria, humidity, &c., the chylopoietic viscera are generally in fault, and require, especially the biliary organs, strict attention. If this complaint is consequent upon suppressed discharges from the uterus, or is even associated with an increase of the natural evacuation, or with a morbid secretion from this organ, particularly about the change of life, organic change in the uterus may be the cause of the nervous disorder; but the restoration of the discharge in the one case, or the removal of the morbid secretion in the other, will have but little effect, either upon the lesion of the uterus, or upon this affection. The nature of this lesion, and the states of the vascular system, and of the digestive viscera, will require the chief attention in these circumstances.

45. v. *Remedies and Modes of Practice advised by authors.* — *a. General bloodletting* has hardly been noticed by any of the numerous writers on hypochondriasis; and *local depletions* have been directed by few excepting to the anus, in order to remove hæmorrhoids, or hepatic fulness. M. Broussais and Dr. Gully, however, recommend leeches to be applied to the epigastrium on account of inflammatory irritation in the digestive mucous membrane, which they consider to exist in most cases of this complaint; and which no doubt forms a part of the pathological states in many cases. In these, an *antiphlogistic regimen* is always requisite, although too frequently neglected by both patient and practitioner.

46. *b. Aperients* and *laxatives* are generally serviceable when judiciously selected; but acrid purgatives are often injurious, although not to the extent believed by Broussais and his followers, unless they be frequently prescribed. My objections to mercurial purgatives (§ 41.) in hypochondriasis are not altered by what has been advanced by Wintringham, Rieff, Curry, and others, in their favour. At the commencement of this century, a calomel epidemic prevailed in British practice, and this medicine was prescribed very generally, and very often injuriously, in this and many other complaints. The repeated doses of it directed by the late Dr. Curry, not unfrequently aggravated the disorder, or converted it into melancholia. The much milder means, however, recommended by the late Mr. Abernethy, namely, an occasional blue-pill at bed-time, and a stomachic aperient in the morning, were often of great benefit, and were rarely attended by any inconvenience.

47. *b.* The propriety of prescribing *narcotics* and *anodynes* in hypochondriasis has been much discussed. Circumstances often arise to require a prudent recourse to them, and others appear which contra-indicate them. Some of them, particularly *opium*, afford temporary relief, and yet are injurious if largely or frequently employed. — *Opium* was recommended by Tralles (*De Usu Opii*, s. iii. p. 35.), Deidier (*Consult. et Obs.* t. i.), and others, and by Thilenius in conjunction with the mineral acids. Dr. Cullen considered it injurious. Hypochondriacs often resort, and readily become addicted, to it; but, unless when under its influence, all their distressing feelings are aggravated by it. Even when used in moderation, it is relinquished with difficulty. I have met with several instances of hypochondriasis, presenting in some an hysterical character, as in females, and in others, the melancholic, in which opiates had been prescribed occasionally for severe or painful symptoms, and in which calomel had been given as an aperient; and in these the patients afterwards had resorted to the same means without medical advice, until the former was regularly taken in excessive doses, every three or four hours, and the latter every second or third night. In two cases, where the acetate of morphia, and in one, where the muriate had been prescribed, these substances were long afterwards continued three or four times in the day, on account of their effects upon the spirits, and gradually increased to one or two grains each dose. In neither of these was there any organic disease detected upon the strictest examination, although there was much functional disorder of the digestive organs. The strength and healthy looks of these patients are now almost restored, by reducing very gradually the dose of the narcotic: by relinquishing calomel, and by enforcing the practice recommended in this article. Yet I fear that the opiate will never be entirely given up, and that the dose of it will even be increased hereafter. In such circumstances no patient can be trusted. The practitioner, in order to overcome this noxious habit, may try the effect of varying the narcotic, of adulterating it, or of combining it with tonics, aromatics, &c.; of diverting the mind by amusement or travel, and of rousing the vital energies by early rising, exercise, tonics, and light diet. Persons who have habituated themselves to opiates will, however, rarely tolerate any other narcotic. I have prescribed for them *hyoscyamus*, *belladonna*, and *conium*. The first and last of these were too weak: the second seemed for a while to answer, but was soon relinquished. These, however, are

often beneficial in this complaint, especially in certain of its complications, in conjunction with camphor or other antispasmodics, or with purgatives, stomachics, &c.; or with tonics or carminatives, according to the numerous modifications it assumes. The *hydrocyanic acid* is also very serviceable in similar circumstances and combinations, to those in which narcotics are indicated. Thilenius and Wurzer recommended the laurel water in this complaint long before the discovery of its active principle.

48. *c. Tonics* of various kinds have been prescribed in order to rouse the nervous energy: but they require much discrimination for the reasons already stated (§ 42.). As congestions and obstructions of important viscera also should be removed, they ought to follow, or to be conjoined with, means calculated to fulfil this intention, and selected with due reference to it. On this account the preference given to *chalybeate mineral waters*, by Zacutus Lusitanus, Drelincourt, Hoffmann, and others, especially those springs which contain deobstruent and aperient salts, along with the iron, is fully justified. I have seen the *arsenical solution* given in some instances, but it is a precarious medicine in this complaint, — it may be even hazardous, and it is not justified even by the circumstances of the affection having followed periodic fever. I have rarely seen any benefit result from even a moderate use of *wine*. It may afford a temporary relief, but it is most frequently injurious, by increasing vascular plethora, and visceral engorgement. Circumstances, however, may arise, in which it should be prescribed medicinally.

49. *d.* Small doses of *ipecacuanha* have been advised by Hufeland, but they are most serviceable in conjunction with *purgatives*, in order to increase their action, or with *diaphoretics*, when the skin is dry and harsh, and then they should be aided by the warm-bath. The production of *artificial eruptions*, as advised by Ritter, Jenner, and the author; or the insertion of *setons*, or *issues*, as directed by De Meza and others, is often of service, particularly when there is evidence of irritation, or of congestion or obstruction of some internal organ. In these cases, the application of *moxas* or of *blisters*, or of stimulating and *rubefacient liniments*, may likewise be tried.

50. *e.* Dr. Gully justly remarks respecting the *Hygeienic treatment* of hypochondriasis, that the mental distractions accompanying the participation in exciting social scenes, the vigorous exertion of the voluntary power implied in strong muscular exercise, and the shocks given to the entire nervous system, are always beneficial in this complaint. The hypochondriac should be persuaded to the exertion of his volition in active muscular exercises. He does not lack muscular power, but he wants the mental energy necessary to its exertion. He should always walk or ride before his meals, rise early, and take half an hour's exercise in the open air before breakfast. His mental faculties also should be actively engaged, as this writer very judiciously advises, on matters alien to his personal health. His imagination should be roused and directed towards other subjects. Although perturbed only with reference to his health, his fears should be met by the reasoning and feeling of his physician, who should endeavour to gain his confidence by evincing a due interest in his case, and combat his morbid feelings in a manner which an educated tact will readily suggest.

51. Upon the whole, although the treatment of hypochondriacs requires to be modified in a thousand ways to meet the innumerable phases of the complaint, and fancies of the patient, the means advised by Stoll (*Rat. Med.* P. i. p. 245.), will be found the most generally appropriate, and the most beneficial, if persevered in: these are, abstemious diet, early rising with friction of the abdomen in the morning, cold bathing and warm clothing, and exercise in the open air.

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HYSTERIC AFFECTIONS.—Syn. *Hysteria; παθος ὑστερικον* (from *ὑστερα*, the womb), *ὑστερικη πνιξ, Suffocatio Uterina, Suffocatio, Suffocatio Mulierum*, Pliny. *Affectio Hysterica*, Willis, Sydenham. *Malum Hysterico-hypochondriacum*, Stahl. *Asthma Uteri*, Van Helmont. *Ascensus Uteri, Strangulatio Vulvæ, Passio Hysterica*, Auct. var. *Hysteria*, Sauvages, Linnæus, Vogel, Cullen. *Hyperkinesia Hysteria*, Swediaur. *Clonus Hysteria*, Young. *Suspasia Hysteria*, Good. *Vapeurs, Mal de la Mère, Affection Hystérique*, Fr. *Mütterkrankheit, Mütterbeschwerden, Aufsteigen der Mütter*, Germ. *Isterismo, Mal di Matrice*, Ital. *Fits of the Mother, Rising of the Mother, Vapours, Hysterics, &c.*

Classif. — 2. *Class*, Nervous Diseases; 3. *Order*, Spasmodic Affections (*Cullen*). 4. *Class*, Diseases of the Nervous Function; 4. *Order*, Affecting the Sensorial Powers (*Good*). II. Class, III. Order (*Author*, in *Preface*).

1. Defin. — *Nervous disorder, often assuming the most varied forms, but commonly presenting a paroxysmal character; the attacks usually commencing with a flow of limpid urine, with uneasiness or irregular motions, and rumbling noises in the left iliac region, or the sensation of a ball rising upwards to the throat, frequently attended by a feeling of suffocation, and sometimes with convulsions; chiefly affecting females from the period of puberty to the decline of life, and principally those possessing great susceptibility of the nervous system, and of mental emotion.*

2. Under this definition may be arranged all those disorders which, from their varied and changing forms, and their resemblance to many serious, and even to several dangerous or structural diseases, have puzzled and misled the inexperienced. Sydenham first gave a full, and, upon the whole, a satisfactory account of hysterical affections; and Whytt more recently threw additional light on several of their forms and relations. Cullen accurately described their more convulsive states, but neglected those anomalous or irregular forms of complaint, which are equally frequent and important with these. From the descriptions of Good, Macintosh, and some other recent writers, it might at once be inferred that their experience as to this disorder was very imperfect; that they were entirely ignorant of the writings of Sydenham and Whytt; and that the state of our knowledge in respect of it had retroceded, instead of having advanced, with the general progress of science. Very recently, however, the able and elegant treatise of Dr. Conolly has retrieved the character of our literature as to hysteria, and furnished us with a more comprehensive view of its nature and treatment.

3. The varieties, forms, and states of hysterical affection are so numerous, that the difficulty of describing and arranging them is very great. The modifications consequent upon age, temperament, diathesis, habit of body, states of nervous susceptibility, physical and moral education, and on the states and grades of society, are so various, that they cannot all be comprised within the limits to which I am necessarily confined. Enough, however, will be advanced to guide the practitioner to the recognition of the nature of such affections as may not fall exactly under any of the varieties

into which I shall divide this complaint. The difficulty of accurately describing disease is great, inasmuch as the phenomena constituting it vary in every case with the circumstances just enumerated, with the causes producing them, and with numerous accidents and occurrences, independently, even, of their duration and intensity; but it is especially great in respect of hysteria. In the history about to be given of it, I shall notice — 1. Its more mild and regular forms; — 2. Its more severe states; — and, 3. The more irregular and anomalous conditions or modes in which it sometimes manifests itself.

4. I. THE MILDER AND MORE REGULAR FORMS OF HYSTERIA present various modifications, depending chiefly upon the number of the circumstances or symptoms characterising them. — *a*. They appear generally in paroxysms or fits, and commonly begin by painfulness or uneasiness in the left iliac region, or hypogastrium, or in the left side; and are often preceded by a large flow of limpid urine, or by palpitations, or difficulty of breathing, flatulency, and rarely by nausea, or vomiting. From either of these situations in the abdomen, a ball, the *globus hystericus*, seems to move, with a rumbling noise, and with various convolutions, to the stomach, and thence to the throat or pharynx, where it remains for some time, and gives rise to a feeling of impending suffocation. The attack in its slighter forms may not proceed further, or it may be attended by several other phenomena of a slight or severe kind. In some cases, headach, stiffness about the larynx, dyspnœa, general uneasiness, cramps, &c., precede or accompany the attack; in others, a vermicular or undulating motion of the abdominal muscles attends the rising of the ball, or *globus*.

5. *b*. The seizure, however, may not end with a sense of strangulation, attending the ascent of the ball to the throat. Other phenomena either attend this, or rapidly follow it, particularly lassitude, sadness, despondency; a sense of coldness, stiffness, or weight in the limbs, with sudden and momentary spasmodic contractions, or general shudderings; headach, noises in the ears, or vertigo; pain and flatulence of the stomach; irregular distension of the abdomen, with borborygmi; a sense of constriction in the throat and pharynx, sometimes with swelling; oppression at the chest, dyspnœa, and irregular breathing; and palpitation, or irregular action, of the heart. These fits may occur at any time through the day, but usually two or three hours after a meal. After a time, either copious eructations of air take place, or anguishing pain at the epigastrium, or in the left side, supervenes, which the patient endeavours to relieve by rubbing violently with the hand. She is frequently incapable of utterance, although evincing much bodily and mental agitation, which generally terminates with immoderate or continued fits of laughter, sometimes causing temporary or alarming suspension of respiration, or with fits of weeping, without any assignable cause, or with an alternation of both. With these latter symptoms, the attack may cease. It may recur in a short time, or not for a considerable period.

6. *c*. *When hysteria assumes a truly convulsive form*, spasmodic actions follow upon the feeling of suffocation, occasioned by the globus hystericus, as it reaches the throat. In delicate women, with great mobility of the muscular system, the convulsions are feeble, and present chiefly a clonic or asthenic character; but in the strong and plethoric, they are more sthenic or tetanic. The trunk of the body is writhed to and fro, and the limbs are variously agitated, one arm and hand (most frequently the right) commonly beating the breast repeatedly. The patient often beats her head against the bed or couch, tears her hair, screams, shrieks, laughs, or sobs and cries immoderately. Sometimes the trunk remains stiff, whilst the arms and limbs are tossed in every direction. The muscles of respiration participate in the struggle, and breathing is effected slowly, laboriously or deeply, and spasmodically, often with deep sobs and constriction in the situation of the diaphragm, and occasionally with hiccup. The respiratory efforts are rendered still more laborious by spasm about the throat, pharynx, and glottis, and the patient often applies her hands to her neck and throat, and rubs or strikes the epigastrium, or left side, with the hand: during the struggle, she sometimes bites her arms or hands, or even the bystanders. The abdominal muscles are tense, or irregularly constricted; the belly, especially about the navel, is often drawn inwards, and the sphincters are firmly constricted. The action of the heart is increased with the severity of the convulsions. In some cases, however, it is not much, if at all, accelerated; in others, it is very irregular and unequal; and in all, the veins of the neck are remarkably distended, the carotids beating with more than usual strength. The face is flushed and tumid, or full, particularly in the plethoric; but in delicate females, it is occasionally pale. The temperature is usually reduced, especially in the extremities, at the commencement of the attack; but it is increased as the convulsions proceed, although in the non-plethoric, it sometimes either continues below, or does not rise above, the natural standard.

7. The *duration* of the fit varies from a few minutes to two or three hours. The recovery from it is attended by a flow of tears, or by a fit of laughter, or by an exclamation, and is generally rapid and complete. Sometimes the patient complains of numbness, or partial palsy of a limb, or of headach, or of loss of voice, after a seizure. And when a copious discharge of limpid urine has not ushered in, it often follows, or both precedes and follows, the attack. Exhaustion, with a desire of remaining perfectly quiet, attends the cessation of the convulsions, but the patient is soon restored to her usual state. She usually retains more or less consciousness of what has occurred in the fit, although she wishes to be thought unconscious of all that has taken place. Loss of consciousness may, however, exist when the fit assumes a very severe or an epileptic form, which it sometimes does in plethoric females; but it is not a general symptom of the purely hysterical convulsion, though ascribed to it by CULLEN and many others. Such fits are ready to recur from time to time; and in the intervals, the patient displays much fickleness, or irritability of temper, is capricious, or even experiences fits of laughing or crying, or of both.

8. II. THE MORE SEVERE FORMS OF HYSTERIA vary more in their characters than in their intensity. — In some cases, particularly in the plethoric, and when the attack is consequent upon obstruction or suppression of the catamenia, the fit presents

most of the symptoms of an epileptic seizure. But the accession is not so sudden as in it, and many of the premonitory symptoms of Hysteria are present. The subsequent exhaustion, stupor, or sleep, is also not so great as after a fit of epilepsy, and the patient rarely injures the tongue or foams at the mouth. She is, however, generally deprived of consciousness. The face is tumid and flushed; the trunk presents a tetanic stiffness, whilst the limbs are tossed in every direction; and respiration is so laborious and so obstructed as apparently to threaten dissolution. In some cases, the patient remains for a time seemingly without breathing, the throat and the veins of the neck being remarkably swollen and distended; and the action of the heart, irregular, hurried, or slow, or entirely interrupted for two or three beats. In other instances, she screams, or utters the most disagreeable and unnatural noises, and grinds the teeth. At last the convulsions cease, and after a period of more or less exhaustion, she recovers, often complaining of headach or slight fatigue.

9. In some instances, after a severe fit, or after violent nervous agitation, and great disorder of the circulating and respiratory functions, the patient sinks into a state of coma, or of hysterical apoplexy, depending upon cerebral congestion. In other cases, a complete state of collapse takes place, respiration being hardly observable, and the pulse so weak, slow, and small, as not to be felt at the wrist. The surface and extremities become pale, cold, and inanimate; and the patient continues in this almost lifeless state for a considerable time. Some of the instances of supposed death, in which persons have been said to have nearly escaped being buried alive, have been of this kind. I have seen some instances of this form of hysteria — *hysterical syncope* — so severe as to occasion some alarm, and M. Villermay considers that death may supervene upon it. Extreme cases of this description have been noticed by Pliny, Lancisi, and others; the instance in which Vesalius began to dissect a body to which life returned on the application of the scalpel, was probably of the same nature. But cases of hysterical coma, or of apoplectic cõngestion consequent upon the hysterical paroxysm, should not be confounded with these. In hysterical coma, the pulse is but little affected; but in hysterical syncope, it can hardly be felt at the wrist. Upon recovery from these states, especially from the latter, the patient often experiences catchings, spasmodic contractions of the extremities, shudderings, or convulsions of short duration, accompanied by forced or irregular respiration. Sometimes the paroxysm is not only severe, but is attended or followed by a kind of delirium, or by nymphomania of short continuance.

10. In a few instances, especially where hysteria is obviously dependent upon irritation or congestion of the uterus or ovaria, the paroxysms change their character and assume the form of *catalepsy*, *extasy*, or of *somnambulism*, or either of these nervous affections takes the place of the hysterical seizure. I have seen several instances, illustrating the connection of these with the severer forms of hysteria; and in some, the tenderness in a portion of the spinal column, so much insisted on by some recent writers, was detected. When these nervous affections are thus associated, the attack may commence, either as a slight, or as a severe hysterical fit, and pass in a short time into the cataleptic or extatic state, or it may begin in the form of extasy, catalepsy, or somnambulism, and pass into the hysterical convulsion: but I have likewise seen the paroxysm consist of one of these in its pure or unassociated state. Besides these more severe states of the complaint, various symptoms may assume an unusual and distressing prominence; the sense of strangulation in the throat may be so great as to occasion the utmost distress and alarm, and it may be accompanied by inability of utterance, by flatulent distension of the belly, borborygmi, and remarkable undulations throughout the abdomen. Occasionally the slighter and severer forms of the complaint will alternate with each other; and the latter is frequently induced when the former has existed, by powerful mental emotions or sudden impressions. Sometimes the severer fits alternate with loss of voice, — *Aphonia hysterica*; — or with temporary paralysis of certain parts, giving rise to *dysphagia*, or to *ischuria* in some instances; and they may even terminate in *epilepsy*, *mental derangement*, or *fatuity*. In some instances of severe hysteria in the unmarried state, I have observed puerperal mania supervene after marriage, and follow almost each confinement. These states of hysteria occur not merely in different persons, but sometimes in the same person at different times. Females who are liable to, or who have suffered from, the disease, often acquire so much sensibility, or become so susceptible, as to be strongly affected by every impression that occurs suddenly or by surprise.

11. In *the intervals* between the paroxysm, the general health is more or less deranged; but some functions betray more disorder than others. Digestion is impaired, and there is often a craving after indigestible or hurtful articles, as cheese, cucumber, acid fruit, acids, pickles, &c.; or after food at improper hours. Digestion is usually attended by flatulence, borborygmi, lowness of spirits, and proneness to tears. The bowels are commonly costive; but they are sometimes lax or irregular. The tongue is red at the point and edges, and slightly furred or loaded, or somewhat white in the middle and base. The pulse varies, the least emotion or surprise causing great acceleration of it, or palpitations of the heart. The catamenia are seldom regular as to quantity, or the period of appearance. They also often depart from the healthy character, in the various ways described in the article Menstruation. They may moreover be delayed, retained, suppressed, too frequent, excessive; or they may be painful, difficult, and attended by various phenomena, referrible to morbid conditions of the uterus or of the ovaria. They may also be preceded or followed by leucorrhœa. So much is the health of hysterical females disordered, and so intimate a connection often exists between such disorder and the hysterical paroxysm, that the latter, especially in its slighter forms, seems merely an aggravation, or an exacerbation, of the more or less continued complaint, or as an increased state of the nervous symptoms.

12. In those cases, which are more obviously dependent upon uterine irritation or vascular determination to the sexual organs, irregular or painful menstruation is generally observed, and the discharge is preceded or attended by pain in

the back, loins, or thighs, or in the sacrum and hypogastrium, with forcing or bearing down, and sometimes by tenderness upon pressure above the pubis. Leucorrhœa is usually present, and sometimes also *dysuria*, or even *stranguria*, although not always mentioned or admitted by the patient. The menses may be very irregular, — at one time excessive, and at another, scanty; — now too frequent, and afterwards disappearing for months. The hysterical paroxysm is often connected with the approach or presence of the catamenia; but it is also often brought on at other times by mental emotions or surprise, and by fatigue, and in some instances it is characterised by signs of an unusual increase of the sexual appetite, amounting in some cases to temporary nymphomania, and constituting the *Hysteria libidinosa* of nosologists.

13. III. THE IRREGULAR AND ANOMALOUS STATES OF HYSTERIA are so diversified that a full account of them can hardly be comprised in the limits of this article. As well as the more fully developed affection they frequently depend upon excitement of the sexual nerves by feelings connected with the instinctive affections and appetites, or upon local irritation of the uterine system. In either case, the one acts upon the other—the mental excitement upon the organic functions, and the local irritation upon the mind; and brings within the range of its morbid influence various parts of the nervous circle; the altered sensibility attendant upon the local affection being manifested, not only in the primary seat of disturbance, but also in other parts, with which there is the most intimate sympathy in particular cases, or which, owing to their naturally exalted state of sensibility, most readily participate in the original affection. Granting that the nerves supplying the uterus, the ovaria, and the more external parts of generation, are in a state of morbid irritation — a state which the conditions and functions of those parts, as well as the symptoms, render extremely probable,—the influence extended to other parts of the economy, particularly in susceptible or delicate persons, may be readily inferred. The relations of these nerves to those supplying the respiratory, circulating, and digestive organs; the circumstance of their being a part of the same system; the effects which they produce, both directly and indirectly, upon the circulation in the brain; and their intimate connection with the nerves of sense and of the spinal axis, will serve to explain many of the phenomena, and to account for the multiplied mutations, observed in hysterical affections. When a disposition to irritation or morbid excitement exists in the uterine nerves, those emotions or feelings which have an intimate relation to sexual function, will often be sufficient to rouse this irritation, and to bring in its train certain of the various morbid manifestations generally associated with it, and constituting its more outward and evident phenomena. The intimate connection existing mutually between certain mental emotions and uterine disturbance, whether the mental or the organic sensibility be first excited, and the close association of both with the more prominent symptoms of hysteria, are so fully established, and are so important in a practical point of view, that they should never be overlooked when affections of an anomalous, an irregular, or Protean form, occur in females from the period of puberty to the decline of life. Many of the affections during this period of female existence not only proceed from the source here stated, and are truly hysterical in their pathological relations, but also simulate other maladies of a more serious nature, and therefore require to be accurately recognised in practice. They, moreover, do not only occur in different cases, but sometimes also several of them may appear in succession in the same person, or two or more of them may exist at the same time, thereby increasing the difficulty of diagnosis.

14. *A.—Altered sensibility, or pain of a truly hysterical nature*, is a frequent occurrence, and in some cases may be mistaken for inflammation of a subjacent or adjoining viscus. The situations in which hysterical pains are most frequently felt, are — *a*. The head, often attended with the clavus hystericus; — *b*. Below the left mamma, or at the margins of the ribs; — *c*. In the region of the stomach and spleen; — *d*. In the course of the descending colon, and in the left iliac region; — *e*. Above the pubis; — *f*. In various other parts of the abdomen, or in the abdomen generally; — *g*. In the region of the kidneys, sometimes extending in the course of the ureters; — *h*. In one or more of the lower dorsal or lumbar vertebræ; — *i*. In the sacrum; — *k*. In the hip, or knee joint. Although these are the more frequent situations, pain may be felt so seriously in others, as to alarm the patient, as in the pharynx and larynx, in one or both mammæ, or in the region of the liver. —

15. *a*. Headach, with or without the *clavus hystericus*, generally limited in extent, especially to the forehead, is a frequent circumstance in both the regular and anomalous forms of hysteria; but I must refer the reader to what I have stated respecting it in the article HEADACH (§ 10.).

16. *b*. *Pain below the left mamma, and above the margin of the left ribs*, is a very frequent occurrence. It may continue for weeks, or even for months with little intermission. It is very circumscribed, is seldom attended with cough, but frequently with palpitation of the heart, and with increased sensitiveness to the impulse of this organ. It is sometimes, although not necessarily, increased by a forced inspiration, and by external pressure. The precise source of this pain cannot be stated with certainty. Dr. ADDISON examined the body of a young woman who had this pain for a considerable time in an aggravated degree, and who died suddenly in a fit. The colon, spleen, heart, and stomach were unaltered, but the cardiac orifice of the stomach was surrounded by a ring of red injected vessels.— Pain in these situations depending upon imperfectly developed hysteria is frequently mistaken for *pleuritis*. The absence, however, of cough, the quiet state of the pulse, particularly when the patient is in the recumbent posture, the versatility and mutability of many of the symptoms, the variability of the patient's mental motions, the existence of disordered catamenia, and especially the absence of the stethoscopic signs of the inflammatory disease, will be sufficient to indicate the nature of the affection. When this pain is attended with palpitations or with morbid sensitiveness of the heart's impulse, and especially if these alternate, or are connected with leipothymia or syncope, *pericarditis* or organic *disease of the heart* may be erroneously suspected by both the patient and the practitioner. But a careful examination into the rational symptoms, comparing

them with the signs evinced by percussion and auscultation, the occasional appearance of decidedly hysteric symptoms, as borborygmi, clangor intestinorum, the globus hystericus, uterine disturbance, and the state of the mind, will here disclose the nature of the disease. In this class of cases, there is also more or less disorder of the digestive organs, and in some, tenderness upon pressure of some of the dorsal vertebræ (§ 23.).

17. *c. Pain in the regions of the stomach and spleen* is another frequent manifestation of hysterical disorder, and is often so intense in the former that the patient screams, leans forward, and expresses the utmost agony. It generally comes on suddenly, and lasts from a few minutes to an hour or more. It is increased by pressure, although not very materially, and the pulse is not much affected. This pain may exist without any nausea or retching; but the bowels are usually costive or irregular. It is sometimes accompanied with a sense of heat or irritation in the pharynx, or is followed by a burning sensation at the epigastrium. There seems to be a very intimate sympathy between the *spleen* and the uterus; irritation of the latter exciting the sensibility and organic contractility of the former in such a manner, as to occasion a belief that it is actually the seat of inflammatory action. The pain felt in the region of the spleen in hysterical cases is never so severe as that which is strictly referrible to the stomach, and pressure is endured much better in the former than in the latter, and often even gives relief. In all such cases, there is no swelling present as in *splenitis*, for which they may be mistaken; but attention to the history of the case, and the good effects of tonic and antispasmodic treatment, will remove any difficulty as to diagnosis, particularly if the functions of the uterus receive due attention.

18. *d. Pain in the course of the descending colon, and in the left iliac region*, may be the only or principal complaint in irregular hysteria. It generally also attends other forms of the disease, and is most frequently seated in the region of the sigmoid flexure, and is attended and aggravated by flatus, which causes a rumbling noise, followed by the globus hystericus, and occasionally by other nervous symptoms. In some instances, the connection of this pain with uterine disorder is very obvious; in others, it is much less so. It is generally independent of disorder of the bowels, although irregularity of them is very frequently observed. That it is purely nervous, is proved by the symptoms, and by the effects of remedies.

19. *e. Tympanitic distention of the intestines* is not an uncommon symptom in hysterical females. Sir B. Brodie states that it has been mistaken for ovarian dropsy, and that the majority of cases of this disease supposed to be cured by iodine and other remedies have been of this nature. I was the first to employ, and to recommend the use of iodine in ovarian dropsy, and I have derived great benefit from it in several cases; but I cannot see how these affections can be confounded with each other, as the diagnosis is remarkably easy. The absence of fluctuation, and the tympanitic sound produced by percussion, sufficiently indicate the cause of distention. It is only when flatus accumulates about the sigmoid flexure of the colon or in the cæcum that there is any resemblance to ovarian dropsy; but other regions, or the abdomen generally, may be distended by flatus, so as to occasion much pain, to impede respiration, and even to disorder the heart's action.

20. *f. Pain above the pubis* is sometimes complained of, but is rarely the only, or even the principal complaint. It is usually attended by more or less tenderness on pressure, and fulness in this situation, with disorder of the excretion of urine. It is generally associated with colicky pains in the abdomen, or in the loins, sacrum, or adjoining parts. It seems to depend upon congestion of the uterus, as it is frequently relieved by local depletion, and by the increase and regular return of the catamenia, which are commonly irregular or scanty. Pain, however, in this situation may attend an excessive discharge, as well as certain forms of leucorrhea. When it accompanies the former, it depends upon irritation, and is more decidedly nervous, unless in very plethoric females, in whom an excessive discharge proceeds from active determination of blood to the uterine system. In some cases of this kind, also, the digestive organs and the functions of the kidneys are much disordered.

21. *g. Irregular hysteria may be manifested by pain in various parts of the abdomen, or in the abdomen generally*, especially about the period of the catamenia, and when they are difficult or scanty. The pain often assumes a colicky character — the *Colica hysterica* of various authors, — and shifts its situation. When it extends over the abdomen, it is sometimes accompanied with excessive tenderness, and great inflation of the bowels. It may then be mistaken for *peritonitis*. Attention, however, to the pulse, the uterine discharges, to the fæcal and urinary excretions, and to the manner and state of the patient's feelings, will assist the diagnosis. In this form of hysterical affection, a marked incongruity will be observed between certain symptoms: greater pain and tenderness will be felt than the pulse, the tongue, and the evacuations should indicate; the most urgent symptoms will suddenly disappear, and as suddenly return; the mind will be variable and susceptible, and some unequivocal hysterical symptom will often arise. The pain and tenderness will frequently shift their situation; the urine will be natural, or pale and copious, instead of being scanty and high-coloured as in peritonitis; and the appearance of the countenance and the postures of the patient will be very different from those observed in inflammations seated in the abdominal cavity. The existence of some derangement in the periods, continuance, quantity, and quality of the uterine discharge, or of pain and difficulty of its accession, or of leucorrhœa, will also tend to confirm the diagnosis.

22. *h. Pain in the region of the kidneys* sometimes extending in the course of the ureters, and even to the urinary bladder, is occasionally the principal affection in hysterical patients. This pain is generally severe and sudden in its attack. When it extends to the bladder, dysuria is often present. This symptom is liable to be referred to inflammation of the kidneys: but here also attention to the existence of uterine disturbance; the marked incongruity of symptoms, particularly between the state of the pulse, the secretions, and evacuations on the one hand, and the pain on the other; the frequent shiftings, the sudden accession, and the as sudden cessation of the pain; and the absence of numb-

ness in the thighs, of vomiting, and of symptomatic fever, will point out the nature of the affection.

23. *i. Pain in the dorsal or lumbar vertebræ,* with tenderness upon pressure of the spinous processes, is often complained of by females of a delicate constitution; and, although it may exist independently of hysteria, yet it is frequently associated either with it, or with uterine irritation. Pain in any of these situations is often also connected with neuralgic affections in various parts of the body, especially in the mammary and intercostal nerves, and in the nerves of the lower extremities, as well as with certain affections of the joints, about to be mentioned. Much diversity of opinion exists as to the nature of the pain and tenderness complained of in the spine, and as to its relation to hysteria and to uterine disorder. It cannot be doubted, that it is frequently connected with one or the other, or with both, and that it may exist independently of either. It is also obvious that, although uterine irritation is often accompanied with hysteria, or with pain and tenderness in the spine, or with both, yet it may be present without either. This affection of the spine has been imputed to inflammatory action in the spinal cord or its membranes, or in some of the adjoining structures; but the accompanying symptoms, the duration of the affection, and the effects of treatment do not warrant this inference as respects at least the majority of cases. It has therefore been attributed to congestion, or to that very indefinite state, to which the term irritation has been applied; but the evidence as to the existence of either of these is entirely of a negative kind. It is probable, however, that the uterine disorder, or the morbid state of the uterine nerves, is propagated by the sympathetic system to the roots of the spinal nerves, and that the sensibility of these last is thereby modified, either in this situation or in one or more of their ramifications. Here, as in many other cases, the primary affection of the ganglionic nerves may not be attended by any painful feeling, although it may induce pain in the voluntary nerves, which it consecutively implicates. From this it will appear, that I ascribe the tenderness and pain in the dorsal or lumbar spine, sometimes associated with hysteria, as well as the painful or neuralgic affections, the tetanic and convulsive actions of the voluntary muscles, &c., to irritation or excitement propagated from the uterine nerves by means of the sympathetic to the roots of the spinal nerves, and to the spinal cord itself. But I at the same time admit that more or less of congestion, or of otherwise disordered circulation in the cord and its membranes may sometimes be also thus produced, giving rise to various paralytic or anomalous symptoms sometimes associated with those already mentioned.

24. Hysterical affections, in which the symptoms are referred to the spine, are sometimes mistaken for ulceration of the intervertebral cartilages and bodies of the vertebræ. Sir B. Brodie has seen numerous instances of young ladies being condemned to the horizontal posture, and to the torture of caustic issues and setons for successive years, whom air, exercise, and cheerful occupations, would probably have cured in a few months. (*On Local Nervous Affections, &c.* p. 46.) Similar instances have occurred to myself, and are familiar to most physicians. When the pain is first complained of in the spine, an attentive examination is often necessary to a positive diagnosis. When it is truly hysterical, it is seldom confined to a single spot, and it often shifts its place. The tenderness of the part is peculiar, and the patient often flinches more when the skin is slightly pinched, than when pressure is made on the vertebræ. The pain is even severer than in real vertebral disease, and when spasms are present they often resemble the muscular contractions in *choreæ.* Sir B. Brodie observes, that surgeons sometimes apply a hot sponge to the spine, believing that, if the patient complains of pain on its application, this is a proof of the existence of *caries.* I perfectly agree with him in considering that a patient labouring under a nervous pain in the back, will complain of the hot sponge even more than one in whom real disease exists. The history of the case, the appearance of other hysterical symptoms, the state of the catamenia, the aspect of the patient, her age, and other circumstances already noticed (§ 21, 22.) will assist the diagnosis.

25. *k. Pain in the sacrum and os coccygis* depends upon irritation or disorder of the uterus, although the uterine discharge may not be manifestly deranged. It is sometimes associated with pain and tenderness above the pubis (§ 20.). I have met with several cases, in which pain in this situation has been referred to inflammatory action, or to organic lesion, and been greatly aggravated by depletions and a lowering regimen.

26. *l. Painful affections of the joints* are not infrequent in hysterical females. The joints most commonly attacked are the knee joints, but I have also met with it in the hip joint, the ankle, and in the wrist. Sir B. Brodie, whose experience of these complaints has been very extensive, states that "at least four fifths of the females among the higher classes of society, who are supposed to labour under diseases of the joints, labour under hysteria, and nothing else." In such cases, the pain is not generally fixed in any one part, but belongs to the whole limb; and when the symptoms are referred to the hip joint, the patient winces and sometimes screams, when either the hip, or the ilium, or the side even as high as the false ribs, or the thigh or leg, as low as the ankle, is pressed upon. The morbid sensibility is chiefly in the integuments; and if they are slightly pinched or drawn from the subjacent parts, the patient complains more than when the head of the femur is pressed into the acetabulum. The more the patient's attention is directed to the part, the more is the pain increased; but if her attention be directed otherwise, she will hardly complain. There is no wasting of the glutei muscles, nor flattening of the nates, nor painful startings of the limb at night, nor frightful dreams, as in true hip joint disease. Sometimes this hysterical affection is attended by much swelling of the nates, or of the thigh, without leading to abscess, owing to turgidity of the small vessels, and to effusion of the more deep-seated cellular tissue. In a case which I am now attending, there is a defined and circumscribed swelling; but there is not the least fluctuation, redness, nor throbbing. Instead of the wasting of the glutei muscles attending hip-joint disease, there is a bulging of the pelvis posteriorly, at the same time that it is elevated on the affected side. Hence the limb is apparently

shortened, and when the patient stands erect, the heel does not come in contact with the ground. This is owing to the predominant action of certain muscles, and to a long-continued indulgence in an unnatural position.

27. When the affection is referred to the *knee*, it resembles that just described. There is great tenderness, but it extends some distance up the thigh and down the leg, sometimes to the ankle and foot. The morbid sensibility is chiefly in the integuments, and not in the deep-seated structures. The leg is usually kept extended, and not bent as in disease of the knee joint. There is occasionally swelling, but this is rarely very great. In a case, however, that I attended, the swelling was very great, its accession and disappearance being sudden. Sir B. Brodie remarks that this affection may continue without material alteration for weeks, months, or even for years. In the case just now referred to, recovery took place in a few days.

28. In hysterical affections of the joints, the catamenia are usually scanty, suppressed, or otherwise irregular. The extremities are frequently cold, and the affected limb is sometimes cold, and at other times warm; or there are frequent alternations of heat and cold. Occasionally towards evening, the surface of the affected joint is hot to the touch, and the vessels turgid; but there is no throbbing or other indications of the formation of matter. As in many other forms of local hysteria, these affections generally appear during bodily exhaustion, or mental depression: they are often excited by the depressing emotions of mind, and are as often benefited by whatever rouses the mental influence, or leads to bodily exertion.

29. *m. Painful affection of the breast* is sometimes met with in females subject to hysterical disorder, and is always connected with derangement of the uterine system. In some instances, especially in the more prolonged, the pain is attended with hardness and swelling of the gland. This affection is liable to be mistaken for a much more permanent and severe disease of the organ. It has been described by Sir A. Cooper and Sir B. Brodie; but it has been noticed by numerous other writers, in connection with hysteria and uterine disorder, and, in rarer cases, with pain in the course of the spine. The patient shrinks from pressure, and cannot bear even the skin to be slightly pinched. The examination of the part often produces twitches, or motions resembling those of *chorea*; yet, if her attention can be engaged otherwise, neither much pain, nor these motions, will be occasioned. The morbid sensibility frequently extends to the axilla, and down the arm. This affection usually disappears after a treatment judiciously directed to the removal of congestion or irritation of the uterine organs, and to the regulation of their functions.

30. *n. Pain is sometimes complained of in the region of the liver, and at the margin of the right ribs.* — It may be mistaken for chronic *hepatitis*, and there may be some difficulty in forming the diagnosis. I was lately consulted in a case of hysteria, where pain in this situation was a prominent circumstance, and was associated moreover with jaundice. A free use of mercurials had increased the hysterical affection, without benefiting the jaundice. This latter, however, disappeared during the use of the alkaline subcarbonates and taraxacum, with gentle bitters and tonics, and antispasmodics. The history of the case, the state of the uterine functions, the appearances of the tongue and of the alvine evacuations, and the absence of pain at the top of the right shoulder, will readily distinguish this affection from chronic hepatitis. The other circumstances alluded to above (§ 21, 22.) will also assist the diagnosis.

31. *B. Irregular hysteria giving rise to, and simulating various spasmodic affections.*—*a.* Sometimes the respiratory organs are the seat of the spasmodic disorder. Occasionally the attack resembles that of *asthma*, the paroxysm of dyspnœa being preceded or attended with many of the symptoms of the hysterical fit. In other cases the patient is liable to paroxysms of a dry convulsive cough — the *Tussis hysterica* of authors. Not unfrequently the hysterical tendency manifests itself by severe or repeated attacks of *hiccough*, or of *sneezing*, sometimes accompanied by loud exclamations. Occasionally, the spasmodic disorder affects some portion of the digestive tube, or shifts along it, giving rise to *dysphagia*, or to porraceous vomiting, or spasmodic gastrodynia, or to colic — the *colica hysterica* of authors. *Hysterical dysphagia* is sometimes attended by the globus hystericus, borborygmi, and even by a dread of swallowing fluids, or *hysterical hydrophobia*. *Hysterical gastrodynia* and hysterical colic are frequent attendants upon difficult, scanty, or otherwise disordered menstruation.

32. *b.* Hysteria may manifest itself chiefly by spasm of the voluntary muscles, giving rise to affections resembling *trismus*, *opisthotonos*, or *pleurosthotonos*. It may also occasion certain anomalous convulsions, and a form of *chorea*, which may be termed hysterical, as partaking of many of the characters of both diseases, and occurring about the period of puberty, generally in consequence of disordered menstruation. In all these affections the pulse is soft, and generally quick, particularly when the patient is erect or sitting up; but it becomes much slower, or natural, as to frequency, when she is recumbent. Irregularity of the menstrual discharge, or leucorrhea, and pain in the left side, or in the region of the spleen, and sometimes tenderness or pain in some part of the spine, attend these affections. The same symptoms, circumstances, and peculiarities, already alluded to with reference to painful hysterical affections, (§ 21.), will also serve to point out the nature of those just mentioned.

33. *C. Hysteria sometimes gives rise to various comatose, cataleptic, or soporific states.* — These states may supervene on imperfectly developed hysteria, or be preceded by hysterical symptoms, particularly borborygmi, the globus hystericus, a variable and excited state of mind, by uterine disturbance, or sudden arrest of the catamenia, &c.; and they may be directly occasioned by fright, sudden surprise, by various mental emotions, sexual excitement, or whatever startles or unexpectedly affects the patient. In these cases the irritation, whether mental, cerebral, or uterine, seems to induce congestion of the vessels of the head, or impeded circulation through them. — *a.* The relation of *catalepsy* to uterine or sexual excitement, and consequently to hysteria, has been manifested in most instances. Since the article Catalepsy was written, I have seen two cases of this affection, and in both these, as well as in those noticed in that article, this relation was

evinced. In one of these, the attack was observed by Mr. Byam and myself from its commencement until its termination.

34. *b. Coma* also occurs in rare instances, and even assumes the form of congestive apoplexy: the patient is insensible, the pulse is regular and full, the respiration is calm or profound, and the face is either natural or flushed. The seizure is usually preceded by indications of hysterical disorder, or of uterine affection; its duration varies from a few to many hours; and unless the patient be injudiciously treated, owing to its being mistaken for apoplexy, it terminates in rapid or sudden recovery of consciousness or voluntary motion, without any paralytic affection. This attack is merely a modification of catalepsy, or it nearly approaches the latter in certain of its states. At the time of writing this article, I was requested by Mr. Grant, of Thayer Street, to see a female, who suddenly became comatose after evincing hysterical symptoms. He judiciously directed cold applications to the head, and a continuance of these for a few hours restored the patient.— The *soporific* form of the attack, or that in which the patient lies as in a profound sleep, respiration being so low as hardly to be noticed, and the pulse weak and small, is more frequent than the foregoing, and has been noticed by Whytt, Villermay, Conolly, and others.

35. *D. Hysteria may simulate paralytic affections.* — In such cases, there is seldom a fully developed state of hysteria, but merely an occasional manifestation of certain of its symptoms, and a concomitance of uterine disturbance in some one of its forms. In most instances of these, as well as of other irregular hysterical affections, the variable character of the temper and mind, and the exalted sensibility and irritability of the body, are evinced. — *a.* The paralytic form of hysteria is sometimes connected with spasm, inability to move being attributable rather to this, than to loss of power. Occasionally, also, it depends upon a deficient exertion of volition, the patient being capable of moving the limb when excited. This affection may occur in a single limb, or in both; it may even closely imitate *paraplegia.* Sir. B. Brodie mentions an instance of hysterical paraplegia, which had been improperly treated, before he saw it, by large depletions, &c., and which consequently terminated in sloughing of the nates and in death; the brain and spinal cord were not altered from the healthy state; the thoracic and abdominal viscera were also sound.

36. *b.* When the paralytic state affects internal parts, particularly the digestive canal, it is limited in extent, and conjoined to spasm in its immediate vicinity. It is doubtful, whether or not, the dyspnœa of hysterical subjects may not also depend upon one or other, or rather upon both, of these conditions.—A seemingly paralytic state of the bladder is also met with in young women, especially those who are subject to pains in the loins, pelvis, or hypogastrium; and, like other paralytic affections, is sometimes attended by pain or tenderness in a portion of the spine *Hysterical retention of urine* arises either from temporary paralysis of the muscular coat of the bladder, or from spasm of the neck of this viscus, caused by irritation of adjoining parts. Hysterical females are liable to an excessive secretion of urine from mental emotion; and if imperfectly exerted volition, or other circumstances, allow its accumulation, the bladder soon loses its contractile power, owing to over-distention. — There is every reason to suppose, that many of the most constant and pathognomonic symptoms of hysteria proceed from irregular spasmodic and paralytic states of the muscular coats of the digestive canal, in connection with inflation, propagated from the large bowels to a greater or less extent, and frequently as far as the œsophagus.

37. *c. Aphonia, or loss of voice* is not an uncommon symptom of hysteria. It may occur alone or follow a paroxysm. It is doubtful, however, how far it depends upon deficient muscular power, or upon spasm. It is sometimes associated with hysterical dyspnœa, cough, or the globus hystericus. Occasionally it is accompanied by symptoms indicating chronic laryngitis, or œdema glottidis. In a case of this description, lately under my care, the hysterical character of the affection became developed after the application of leeches.

38. *E. Hysteria may manifest itself chiefly by disorder of the mental emotions and faculties.* — The mental affections connected with hysteria may be referred to one or other of the following: — 1st. To certain states of monomania, amongst which excited desire, amounting in some cases to nymphomania, may be enumerated; — 2d. To *ecstasis* and mental excitement, in some cases of a religious nature, in others of different descriptions; — 3d. To a state of somnambulism; — 4th. To a form of delirium, generally of a lively character, with which various hysterical symptoms are often conjoined; — 5th. To various delusions, generally of a hypochondriacal kind, to which the patient may become subject, or even the victim, owing to the indulgence it may meet with from imprudently kind relatives; and 6th. To a desire to feign various diseases, sometimes of an anomalous or singular form. In all these, the occasional occurrence of hysterical symptoms; complaints of shifting, transitory, or anomalous pains; disorder of the uterine functions; the nervous temperament, and the hysterical state of constitution, will evince the precise nature of the affection.

39. *F.* Irregular or imperfectly developed hysteria not merely assumes one or other of these states, but sometimes presents two or more of them; or the one complaint may succeed the other. Hysteria may even put on certain anomalous appearances, which cannot well be classed or accurately described, but which will be readily recognised by the physician after a careful examination of the uterine functions and of the temperament, habit of body, constitution, occupations, recreations, and modes of living of the patient. Some of these local and simulating complaints, as coma, palsy, delirium, &c., may follow the regularly developed paroxysm in one of the severer forms above described (§ 8—10.); but they as frequently appear as the prominent ailment, and as here mentioned. They may also gradually pass into, or nearly resemble, other nervous or convulsive affections described under the heads of Chorea, Catalepsy, Cataleptic Extasy, Convulsions, Epilepsy, Hypochondriasis, &c.

40. IV. Hysteria in Males?—Numerous writers of great respectability have believed in the occur-

rence of hysteria in males during states of debility. I have never met with a case, however, in which the complaint was unequivocally developed; but I have seen several nervous affections in males of a susceptible and irritable temperament, weakened by disease, or by over-exertion, that have assumed some of the characters of hysteria, particularly in its irregular or undeveloped state. Cases of hypochondriasis and of melancholy in the male, occasionally present somewhat of an hysterical character; thus I have met with an instance of hypochondriasis in a gentleman aged about forty, who complained of painful attacks of priapism, of a feeling of stricture about the throat, with shedding of tears, miserable depression of spirits, &c.; and yet who could readily join in lively and amusing conversation. Such instances serve to show the relation existing between hysteria and hypochondriasis—a circumstance not less deserving attention, than the distinctions between them. Of the facts adduced and alluded to by SYDENHAM, HOFFMANN, WHYTT, FERRIAR, VILLERMAY, GEORGET, and CONOLLY, favouring the opinion as to the occurrence of hysteria in males, the most conclusive is that recorded by Mr. WATSON (*Edin. Med. and Surg. Journ.* vol. xi. p. 303.). A strong man complained of giddiness and headach, and was seized with epileptic convulsions. After some hours, the symptoms returned with alternate laughing and crying, spasms about the throat, and inability to speak, although he was perfectly sensible. Dr. TROTTER states (*Medicina Nautica*, vol. ii.), that hysteric fits occurred in some cases sent to hospital ships, and that they were attended "by violent convulsions, globus, dysphagia, immoderate risibility, weeping and delirium." It is very possible, that unaccustomed continence in the male may, in rare cases, and in the nervous temperament, give rise to seizures of an hysterical nature. I was consulted by a young gentleman, who complained of headach and several of the symptoms of hysteria, after prolonged periods of continence. I recommended him to marry: he adopted my advice. I saw him two or three years afterwards, and he told me he had had no return of the complaint. A similar instance to that adduced by Dr. CONOLLY, and which arose from intense study, occurred to me some years since. I was recently consulted in the case of a young man of the nervous temperament, who had become early addicted to drunkenness, and who relinquished the habit under the guidance of his friends. Soon afterwards, upon the occurrence of a domestic calamity, he was attacked by a nervous complaint, in which it was difficult to determine whether the hypochondriacal or hysterical character predominated.

41. V. COMPLICATED HYSTERIA.—Hysteria may appear, in either its developed or irregular forms, in the course of numerous other diseases. It may occur at the crisis of, or during recovery from, fever or inflammatory diseases; during the progress of, or in early convalescence from, inflammations of the respiratory organs; or in the course of pulmonary consumption. It is sometimes complicated with asthma—*Hysterical Asthma*; and is very generally a symptom of, or associated with, inflammations of the uterus or ovaria, particularly when these take place independently of the puerperal states. It frequently also attends leucorrhœa and structural lesions of these organs. Hysteria may occur during pregnancy; but it is oftener suspended by this state, as well as by lactation, although it sometimes appears a few weeks after delivery. Its frequent connection with irritation of the spinal cord, with functional disorder of the heart, &c., has been already alluded to; and it is often associated with hypochondriasis. It is often also consequent upon derangements of the digestive organs, especially those in which the gastro-intestinal mucus surface is in a state of irritation. It is not infrequently connected with disorder of the urinary organs, the urinary secretion and excretion being affected in various ways, besides that which more usually characterises the hysteric seizure. When hysteria appears in the course of other maladies, it is generally owing to the temperament and constitution of the patient, and to debility or exhaustion of nervous power, from disease or from treatment. Hence its occurrence after excessive or inappropriate depletions, after hæmorrhages, after parturition, and after fevers.

42. When hysteria is complicated with these or other diseases, or when these affect hysterical females, a prolongation of disease, or further complications, and a protraction of convalescence, are frequently produced. Dr. CONOLLY justly remarks, that in the course of a long hysterical disorder, and yet more readily in the course of fever in an hysterical patient, inflammatory action may take place at the origin of previously irritated nerves, or in the brain, or other organs: tenderness of the spine may become excessive; and disordered sensation and impaired power of motion may indicate the existence of something more than mere irritation. These symptoms may disappear as the patient gains strength; but they sometimes become more intense and constant, and assume a more serious form than the shifting, evanescent, or local tenderness and pain, affecting various parts as described above (§ 14.).

43. VI. DURATION AND TERMINATIONS.—*a.* The *duration* of the *paroxysm* of hysteria varies from a few minutes to many hours; but the continuance of the complaint is very uncertain. Hysteria may not again recur after a single seizure, especially if it have been induced by the more powerful causes; but this is seldom the case, for when it has once appeared, there is a predisposition to its return in one or other of its various forms, upon the recurrence of any of the predisposing or exciting causes. Much, however, will depend upon the general health and circumstances of the patient. It may thus re-appear after intervals of various duration; or it may hardly ever be completely absent, in some one or other of its numerous modes, during the greater part of the period between puberty, or the age of twenty, and the complete cessation of the catamenia. It seldom occurs even in those subject to it after this latter epoch: yet I have seen instances of it induced by mental emotion, at a much later period of life. A very large proportion of the ailments of females during the period of uterine activity, however diversified their characters may be, are really hysterical. Hence many females enjoy much better health after this change has been quite completed than they did previously; although about the period of change, their complaints are often aggravated.

44. *b.* The *Terminations* of hysteria are —1st.

In a more or less complete restoration of health. 2d. In some other complaint, into which it may altogether merge and disappear, or with which it may become associated. It rarely or never terminates in death, unless from neglect or improper treatment. — (*a*) Restoration of health depends very much upon the attention paid during treatment to the removal of the causes, to the state of the general health, to the uterine functions, and to associated disorder. — (*b*) Hysteria may pass into epilepsy, or assume various convulsive forms. It may terminate in mania, and more rarely in confirmed insanity, or in mental imbecility. Females who have been subject to hysteria in the unmarried state, especially if it have assumed the fully developed or convulsive form, are more disposed than others to puerperal convulsions and to puerperal mania; although marriage sometimes entirely removes, or ameliorates the complaint. It may also terminate in inflammation of the membranes of the brain, or of the spinal cord; but this does not occur so frequently as some suppose. It occasionally gives rise to inflammation of the uterus, or of the ovaria; but in these cases, the irritation or congestion of these parts, and disorder of the uterine functions, upon which the hysteria depended or was associated, are only more fully developed, or converted into the inflammatory state by it. Although it often deranges the functions of the heart and lungs, it seldom occasions serious diseases of these organs; but it often aggravates pre-existent disorder of them, as well as of the several digestive viscera.

45. VII. DIAGNOSIS.—It is generally easy to distinguish the more fully developed states of hysteria from other affections; yet this is occasionally very difficult; and it is particularly so to distinguish several of the more irregular forms of the complaint from those diseases which they so closely simulate. Of the *diagnosis* of these forms I have made sufficient mention in my descriptions of them. — *a*. Fully formed hysteria may be mistaken for *epilepsy*, and the mistake is the more likely to occur, as the former may pass into the latter, particularly when affecting plethoric persons, or when neglected; but it then usually assumes the uterine form of epilepsy. PINEL, VILLERMAY, and CONOLLY, have properly insisted on the importance of forming a correct diagnosis between these two maladies, and especially of not imputing epilepsy to a female who is merely hysterical. "It is important to humanity, and to the peace and happiness of families," adds M. VILLERMAY, "that these complaints should be correctly distinguished." Epilepsy is an hereditary disease, is incurable in the majority of instances, and generally weakens the intellects and the understanding — circumstances which cannot be imputed to hysteria. — SYDENHAM, TISSOT, and VILLERMAY advise that not only should the symptoms and mode of attack in both be inquired into, but also the causes which occasioned the seizure: yet too much reliance should not be placed upon these in the formation of a diagnosis. The most frequent causes of *hysteria* are, the emotions of love and jealousy, voluntary or compelled continence, longings after ardently desired objects, or unsated desire, disorders of menstruation, &c. (§ 54.); — those of *epilepsy*, on the other hand, are hereditary predisposition, fright, terror, &c. (See art. EPILEPSY, § 19—24.)

46. In *epilepsy*, the seizure is sudden or instantaneous; the patient often utters a loud cry, falls violently to the ground, froths at the mouth, protrudes the tongue, which is generally injured by the teeth, and is altogether unconscious. The eyes are distorted, the muscles of the face violently convulsed, and the pupils are insensible to light. There are generally no precursory symptoms, and there is no sensation of globus hystericus. The epileptic attack terminates in sopor, or a heavy sleep, from which the patient awakens exhausted, complaining of headach and depression. In *hysteria*, on the other hand, the seizure is more gradual; is generally preceded or attended by the globus; neither frothing at the mouth, nor protrusion of the tongue, nor distortions of the face and eyes characterising it. The hysteric patient retains her consciousness, or remembers what has passed during the paroxysm; and although she laughs and weeps alternately, the muscles of the face are not otherwise convulsed. At the termination of the fit, there is often a tendency to sleep, or rather a desire to remain quiet; but there is no sopor or heavy sleep, unless in the comparatively rare form of hysterical coma. There are always borborygmi, pain in the left side, and a copious flow of urine. M. GEORGET attaches most importance to the absence of the precursory symptoms observed in hysteria, the complete loss of consciousness, and the distortion of the mouth, protrusion of the tongue, and state of the eyes, in determining the existence of epilepsy. When hysteria is about to pass into epilepsy, distortion of the eyes and of the muscles of the face is the surest indication of the transition; and when to this, frothing at the mouth, injury of the tongue, and complete loss of consciousness are added, the epileptic character is fully developed. Numerous other circumstances connected with the history of the case, and the occurrence of the attack, already stated in the description of both diseases, will assist the diagnosis. When a convulsive paroxysm occurs in males, there can be rarely any doubt as to its nature; but when it appears in females, an attentive inquiry into its peculiarities, and into the state of the uterine functions, is especially requisite; for, although it may be hysterical, it may pass into the epileptic form, or it may present a mixed character, but attention to the pathognomonic symptoms just stated, will readily determine the nature of the seizure.

47. *b*. Although *hypochondriasis* and hysteria are distinct diseases, yet they frequently approximate each other, or are even associated in females; indeed, most hysterical females may be said to be hypochondriacal, especially if hysteria has become habitual or confirmed. Dr. CULLEN remarks, that the two diseases have some symptoms in common; but they are for the most part considerably different. Spasmodic disorder is rare in the one, but frequent unto a great degree in the other. Persons liable to hysteria are sometimes affected at the same time with dyspepsia: they are often, however, entirely free from it; but this never happens to those subject to hypochondriasis. These complaints occur mostly in different temperaments, ages, and sexes; a circumstance requiring no illustration. The association of them in the female, and perhaps in rare instances in the male, as in the cases above alluded to (§ 40.), is of too much importance to be overlooked. Considering how

much the several parts of the body are connected, and how much the several functions depend upon each other, we cannot wonder that their morbid affections should often be mixed, or insensibly pass, the one into the other; the effect of this is indeed that there are no universal distinctions, and that in a few cases only are there exact limits between analogous or similar diseases. Accurate observation and precise description do much in extricating us from this confusion; but in some cases still, we must remain in doubt and in difficulty. Yet even in these, it will matter but little as to what name we may use, so long as we recognize and estimate with accuracy the nature, extent, and relations of the morbid condition.[*]

48. VIII. Causes.—i. *Predisposing.*—Hysteria may be said to be almost peculiar to the *female* sex; for the instances of its appearance in the male are so rare, and so problematical, as respects its fully developed and convulsive states, as hardly to be taken into account. — *a.* The *age* at which females are most liable to it is from fifteen to fifty; and especially from twenty to thirty, and again from forty-two to forty-eight. It sometimes does not occur until the latter epoch; but it rarely recurs at a later period of life. Hysteria is very seldom observed before puberty; but considering that menstruation commences in some cases, particularly in young ladies in boarding-schools, as early as the tenth and eleventh years, the appearance of this complaint, in some one or other of its forms equally early, cannot be a matter of surprise. — *Temperament* and *diathesis* evidently predispose to hysteria;— nervous, sanguineo-nervous, and irritable temperaments, and persons of a lax, weak, or delicate, impressible and soft habit of body are most subject to it. As this state of constitution is derived from the parents, the opinion of Hoffmann, Frank, and others, as to its occasional dependence on hereditary predisposition, cannot be disputed. The children of debilitated, exhausted, or aged parents, and those who are of an impaired constitution, either originally or from early management and education, are most likely to be subject to this disorder. — A plethoric *habit* of body, joined to relaxation or deficient tone, predisposes to the more developed or convulsive states; and a thin or spare habit, associated with delicacy of conformation and susceptibility of the nervous system, to the more irregular forms.

49. *b.* There is perhaps no other malady, which depends so much as this upon the *management* of childhood, and on the moral and physical *education* of early life. A luxurious and delicate mode of living, and of rearing; a neglect of whatever promotes the powers of the constitution, especially of suitable exercise in the open air, and of early hours as to sleeping and rising; an over-refined mode of education, and the excitement of the imagination and of the emotions, to the neglect of the intellectual powers and moral sentiments; too great devotion to music, and the perusal of exciting novels; the various means by which the feelings are awakened, and acute sensibility is promoted, whilst every manifestation of either is carefully concealed; and studied endeavours to dissemble desires which struggle to be expressed, — all serve, especially at a period when the powers of mind, and the conformation of the body are approaching development, to produce that state of the nervous system, of which hysteria is one of the most frequent indications. About the period of puberty in females, various circumstances connected with their education tend to weaken their constitution, to excite their emotions and desires, and to cultivate their imaginative and more artificial faculties, at the expence of their reasoning and moral powers Whenever numbers associate previous to, or about the period of puberty, and especially where several use the same sleeping apartment, and are submitted to a luxurious and over-refined mode of education, some will manifest a precocious development of both mind and body; but in proportion to precocity will tone and energy be deficient, and susceptibility and sensibility increased. In these circumstances also, organic sensibility, particularly as relates to the uterine system, often assumes a predominance powerfully predisposing to hysterical affections. There can be no question, although the subject has been but rarely approached by British medical writers, that indulgence in solitary vices and sexual excitements, is not an infrequent cause of this, as well as of other disorders. Numerous writers have insisted upon the propriety of giving due consideration to this source of mischief, as well as to the ennui and chagrin attending celibacy and continence. I agree with Dr. Conolly, in believing that English practitioners pay perhaps too little attention to these and other related circumstances; and that, in a country where the passions and emotions are so carefully suppressed, or concealed, they sometimes seem to forget their silent operation on the frame, and charge the medical writers of other countries with being somewhat fanciful and extravagant.

50. *c.* Besides the above, there are various circumstances connected with the *social state,* that tend to develope these conditions of the uterine organs and nervous system, in which hysterical disorder originates. M. Georget remarks, that the progressive steps of life, as youth passes away, are sources of painful moral affections, especially to the frivolous, the vain, and the unmarried of the sex. These affections increase the susceptibility of the nervous system, and, with numerous other circumstances yet to be mentioned, dispose to the nervous disorders of the more advanced epochs of life. There can be no doubt, that pampered modes of living; an early or habitual indulgence of temper, or of the emotions and desires; the use of wines and liqueurs, even within what may appear the bounds of moderation; late hours, and late rising; insufficient modes of exercise, or the want of it, and of pure air; neglect of the requisite exposure to light and

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[*] M. Brachet, in distinguishing between hysteria and hypochondriasis, says that the former is a spasmodic affection of the cerebral nervous system, to which he has given the name of *cerebral neurospasm* (*neurospasmie cérébrale*), and that the latter is a disorder, a vitiation, an aberration of the two nervous systems, which he denominates a *cerebro-ganglial neurotaxy* (*neurotaxie cérébro-ganglionaire*). Thence he infers that there can be no identity as to seat or affection between these two diseases; for the one is a spasmodic affection of the cerebral system only, and the other is an ataxy of the two nervous systems. He moreover states that there is no farther analogy between them, than the participation of the cerebral nervous system in the two maladies; but that, in hypochondriasis, the ganglial system is equally compromised. Hence, 1st. They are not identical affections: — 2d. They differ in their seat and nature; the phenomena in the one being spasmodic; in the other, vitiation of function.

sunshine; and sedentary occupations, particularly in over-heated and crowded apartments or factories, more or less predispose the female constitution to this affection. Some writers believe that the use of tea and coffee has a similar effect; it is possible that the former, especially green tea, taken too frequently or in excess, will weaken the nervous system; and that the latter will sometimes excite the uterine organs. The influence of *climate* is not very manifest; temperate and changeable regions certainly furnish more numerous instances of nervous disorder in females, than very warm or very cold countries; but as much is probably owing to the state of *manners* and *society* in the former, as to climate. Even *dress* has some effect in the production of hysteria; inordinate compression of the waist by stays not only weakens and displaces the digestive organs, but favours local determinations and congestions, and deranges the uterine functions.

51. *d. Previous disorder* more frequently predisposes to hysteria, than other circumstances, for many of those already noticed induce other complaints, before hysteria, in any of its forms, is manifested; and these complaints constitute merely that state of predisposition, which only requires the occasion or exciting cause of its appearance. The various disorders of MENSTRUATION (see that article), determination of blood to, or congestion, or irritation of any of the uterine organs, may exist, and yet no hysterical affection take place. The nervous system also, both ganglial and cerebro-spinal, may be susceptible and morbidly sensible, and yet none of the phenomena constituting hysteria may appear. These, as well as some other morbid states, frequently constitute only the predisposition, which, however, will readily burst into open disease, when one or more of the exciting causes come into operation. Whatever exhausts organic nervous power will increase susceptibility and irritability, and thus constitute that mobility of the system, and disposition to local determinations and congestions, justly insisted upon by Dr. CULLEN, as being connected with the pathology of the complaint. The susceptibility arising from exhaustion by acute disease favours the appearance of hysteria, especially during early convalescence. The approach and presence of the catamenia have also some influence, both as a predisposing and an exciting cause.

52. *Gastro-intestinal disorder*, or irritation, has been justly viewed by numerous writers, as a predisposing cause of hysteria, and particularly insisted upon by BROUSSAIS and his followers. Although this writer has doubtless exaggerated the influence of this morbid condition, and imputed to it phenomena depending chiefly on debility and augmented organic nervous sensibility, yet it is nevertheless often present, associated, however, with other morbid states, as those just named, and with impaired action and flatulent distention of the digestive canal. In some cases also, the gastro-intestinal disorder is almost coeval with, and purely a complication of, the hysterical affection. But it is much more frequently observed, that numerous circumstances tending to disorder the digestive mucous surface, especially errors in diet, as respects both food and drink, and various symptoms indicating impaired or disordered digestion and fæcation, have preceded for a longer or shorter period the development of the hysterical disorder. Still it must be admitted, that the symptoms referred to the alimentary canal, especially impaired function, flatulent distention and borborygmi, and altered sensibility, are greater indications of debility of the organic nervous system, than of inflammatory irritation of the gastro-intestinal mucous membrane. Nor should it be overlooked, that disorder of the uterine organs, seated not merely in the nerves, but affecting also vascular action in these organs, may exist without exciting painful sensations, and yet sympathetically disturb the digestive canal. Thus we perceive the changes produced in the uterine system by impregnation displayed chiefly in the digestive organs and nervous system. Even the errors of diet, and the desire for various improper or indigestible articles of food and drink, which has been attributed to disorder of the alimentary canal, may be actually occasioned by changes originating in the uterine organs. These substances, however, by increasing the disorder of the digestive tube, will aggravate or perpetuate the primary affection of the sexual organs. There can be no doubt, that whatever weakens organic nervous power, as all disorders of the gastro-intestinal viscera necessarily do, will both dispose to, and increase, hysterical complaints.

53. It has been supposed by some writers, that the females of *gouty* parents are more prone than others to hysteria. This may be partly accounted for, by deficiency of constitutional energy derived from the parent, and greater susceptibility of the nervous system, as well as by the circumstances alluded to above (§ 49.).

54. ii. *Exciting Causes.* — Certain of the predisposing causes may of themselves occasion the complaint, when more than usually active, especially disorder of the uterine organs, or of the digestive canal. Excitement of the nerves of the uterus or ovaria, or irritation of them, particularly in connection with any irregularity of menstruation; inflammatory action, of an acute, subacute, or chronic nature, of the vagina, or of these organs; congestion, structural lesion, tumours, polypi, &c., of the uterus, and leucorrhœa, not infrequently occasion hysteria. Although this disorder is very often connected with excitement, or even with inflammatory irritation in the ovaria, yet it is seldom symptomatic of fully developed ovarian dropsy. It is not improbable, that this latter malady proceeds from a state of impaired tone, or is associated with a condition of the organic actions in these parts, incompatible with the production of the hysterical paroxysm. Irritation of the gastro-intestinal mucous membrane, by stimulating or acrid ingesta, particularly such as act upon the colon and rectum, as large doses of aloes, colocynth, &c.; morbid secretions, mucous sordes, and fæcal collections in the large bowels; the irritation of worms, especially of ascarides, in the rectum—the *Hysteria verminosa* of SAUVAGES; the use of stimulating or acrid glysters; and hæmorrhoids, sometimes excite one or other of the forms of the complaint. Excessive discharges and hæmorrhages, particularly prolonged leucorrhœa, diarrhœa, abortions, uterine hæmorrhage, and protracted suckling, on the one hand; and on the other, the suppression of discharges, as of the catamenia, of the lochia, and of leucorrhœa; long or extreme suffering from pain; mental or bodily

fatigue; and even irritation of remote parts, as that connected with cutting the wisdom teeth, occasionally induce a seizure.

55. Mental affections and excitements, especially those which act upon the uterine system in particular, disappointments in love, unreturned and spurned affections, jealousy, anger and other violent emotions; protracted expectation, longings after objects of desire, tragic representations, frights, the sight of objects, disgusting or distressing, or disagreeable from peculiar mental diathesis, and intelligence of a distressing or of an exciting nature, suddenly communicated, are the most common occasions of hysteria, as respects both its first appearance, and its subsequent recurrences. Several of these emotions affect the uterine organs, the affection being afterwards reflected upon the nervous system generally. Premature or physically incongruous marriages; excited, but unsatisfied, desires; celibacy, and veneris desiderium inane, are also not infrequent causes of the complaint. FRANK remarks, that "Cœlibem vitam plures sine noxâ ducere possunt fœminæ, sed vix unam illarum invenies, quæ prope maritum impotentem impune decumbere possit. Idem de uxoribus, a maritis neglectis, valet." — There is no doubt, that the sight of others in the fit will sometimes produce an hysterical seizure. I have myself witnessed this on two or three occasions; and in one of these, two females were attacked from this circumstance. This phenomenon has been imputed to imitation; but it may with equal propriety be assigned to sympathy, to fear, &c. Probably more than one of these feelings are concerned in producing it. Severe mental distresses, or extreme joy, may also occasion some one or other of the forms of the complaint. Immoderate fits of laughing produced by humorous or ridiculous occurrences, or crying caused by vexation or contrarieties, may also pass into the hysterical paroxysm. I have no doubt of the fit being often renewed at pleasure, almost as readily as tears may be shed, by recalling or adverting to various feelings, emotions, or circumstances; and I have even seen instances which have convinced me of the fact. Electrical and warm states of the air, and sudden vicissitudes of temperature, have been supposed sufficient to produce a seizure. The influence of spirituous or vinous potations, of stimulating diuretics, and of substances which excite or irritate the urinary bladder, in the production of the complaint, is much less doubtful than that of atmospheric temperature; but the close, warm, and impure air of crowded rooms and assemblies, particularly in connection with excited feelings or contrarieties, very often occasions an attack, especially in those who have previously experienced it. A similar effect is in rarer instances produced by various odours, especially in peculiar idiosyncracies. HIGHMORE states that the fit has been often induced by the odour of musk.

56. IX. PATHOLOGY. — The nature of hysteria may be in a great measure inferred from what has already been stated respecting its symptoms and causes; yet something more explicit still must be advanced on this subject. As simple and pure hysteria is rarely or almost never fatal, and as we therefore have hardly ever an opportunity of examining the state of the principal viscera of patients who had been subject to this complaint, unless they have died of some intercurrent or associated malady, so proofs have been wanting in support of any of the doctrines proposed as to its nature, and a very wide scope allowed for vague hypothesis. The ancients and many of the moderns referred hysteria to the womb; and hence the origin of the name. The ancients, however, ascribed properties, powers, functions, and motions to the uterus, which modern knowledge has shown to be erroneous; yet I am disposed to believe that this organ, influenced as it most probably is by the nervous and vascular states of the ovaria, performs a very important part in the œconomy; and that this is not confined to alterations merely of its organic sensibility, but that it extends frequently to its contractility, and to several related organs.

57. Some recent writers have ascribed hysteria to irritation in the uterus, in the intestines, in the brain, or even in other internal viscera, occurring in delicate, nervous, or susceptible persons. Dr. CONOLLY remarks, that in all cases of hysteria there is a disordered state of some part or the whole of the nervous system; and that, although this state may be, and very frequently is, induced by uterine irritation, it no less evidently arises, in other cases, from causes productive of irritation in other parts of the body, and also from causes acting directly upon the mind. That more or less susceptibility, original or acquired, characterises the state of the nervous system in hysterical persons will not be disputed; yet even in such persons, the usual exciting causes, or irritations of different viscera, will not occasion true hysterical symptoms, unless they previously affect the state of organic nervous influence, or of circulation, in the sexual organs.

58. WILLIS ascribed hysteria to disorder of the brain, and M. GEORGET has recently adopted the same view, which has been most ably and satisfactorily overthrown by M. FOVILLE. Still more recently Mr. TATE has contended that hysteria arises from a morbid state of the spinal cord, connected with disorder of the womb; but, as I have already remarked, this "morbid state" is but a vague generic term, and that, most probably, even when it is most prominent, more of altered sensibility than of vascular or structural lesion, of this part of the nervous system constitutes its essence. However this may be, attentive observation of the morbid phenomena, especially at their commencement, will show that the spinal affection is merely a consecutive and contingent disorder, and one by no means generally, or even very frequently, observed. This want of precision in the use of terms, and in the ideas relating to the pathology of hysteria has been surpassed by M. ANDRAL, when he says, "As to my opinion respecting the seat of hysteria, I repeat, that it is a nervous complaint, and that its seat is the nervous system!"

59. Although the uterus and its appendages have been viewed as the chief source of hysteria, both by the ancients, and by most of the moderns, yet some difference of opinion exists as to the nature of this primary affection. PINEL, VILLERMAY, LOBSTEIN, and FOVILLE consider that it is entirely nervous, or is an excited state of the nerves supplying the organs of generation. Other writers, as ADDISON, &c., who have adopted the term uterine irritation, seem to ascribe to this

term a similar meaning to that which the above authors have wished to convey; although they contend, that, in connection with this state, the uterine functions are very often disordered. M. PUJOL, on the other hand, infers the existence of chronic inflammatory action of the uterus, as the immediate cause of the complaint. Inflammatory action in its various grades, from simple erethysm upwards to the most acute vascular change, may sometimes be a complication or cause of hysteria; but there is no necessary dependence of the one upon the other; for we often meet with *metritis*, without hysterical symptoms, and still more frequently with fully developed hysteria, without any evidence of metritis. Yet it should not be overlooked that the former is often symptomatic of, or complicated with, the latter.

60. When we consider the number and importance of the nerves of the female organs of generation; the connections existing between them and the nerves supplying the kidneys, the urinary bladder, and the intestinal canal on the one hand, and the spinal and sacral nerves on the other; and the fact that these nerves are small and apparently few in girls, large and numerous during the epoch of uterine activity, and very small in old women; the sympathetic effects of irritation, excitement, or of erethysm of them will be more readily recognised, and the relation of these sympathies to their source made more obvious. Attentive observation of the causes of hysteria, and of their more immediate effects upon the generative system, and a knowledge of the sensations of the patient with reference to the origin and course of this ailment, will prove, that the old opinion as to its source is correct. That the primary affection is seated in the nerves of the generative organs, and that it consists chiefly of excitement, erethysm, or irritation, sometimes, however, associated with congestion or vascular determination to the uterus, or with disorder of the catamenia, are shown by the circumstances in which it is observed, and the fact that it never appears until these nerves have approached their full development, nor after their principal functions have ceased. GEORGET, however, contends in opposition to this opinion, that organic lesions of the uterine organs are very common in females, who have never had hysteria; and that the more serious changes, as cancer uteri, uterine polypi, ovarian dropsy, &c., are seldom accompanied with this complaint. But the most of these maladies do not appear during the epoch, in which hysteria is most common. As long as the uterine functions and sympathies are active, hysteria will occur. Hence its not infrequent connection with metritis and other uterine diseases, during the prime of life; but when these functions and sympathies are exhausted or greatly enfeebled, as in most of the dangerous maladies and organic lesions of the uterus and ovaria, as well as in advanced life, hysteria will not be developed. The generative nerves have then become incapable of experiencing that state, and of exerting that influence upon the nerves related to them, which are requisite to the production of hysterical phenomena. As M. FOVILLE has justly observed, we do not find sexual ardour amongst the symptoms of malignant alterations of the testes, or of hydatids in the spermatic cord, &c. Hysteria does not occur in aged females, for the very same reason that menstruation and pregnancy do not take place in them. The belief that hysteria may affect males has been adduced against its uterine origin; but the fact of true or unequivocal hysteria having been met with in males, needs further confirmation; or rather the nervous affections, resembling some states of hysteria, noticed in this sex, require a closer observation than they have hitherto received. I will not, however, deny, that irritation of the male sexual organs will not occasionally produce disorder, in many respects similar to that observed in females in like circumstances, particularly in susceptible and nervous persons.

61. My views, therefore, as to the *pathology of hysteria* are as follows: — *a*. That hysteria arises from the state of the organic nervous influence endowing the generative organs of the female, and that a similar state of the sexual organs of the male very rarely occasions it, and then only in peculiar circumstances; — *b*. That this state of nervous influence nearly approaches to, or consists of, excitement, nervous erethysm or irritation, or is of an active or sthenic kind, as respects the functions of these organs; — *c*. That this is generally attended by vital turgescence of the vessels of the uterine system; and these states, consequently, occur chiefly during the prime of life, or whilst the nerves of generation and the uterine circulation possess their functional energies; — *d*. That these conditions of nervous influence and circulation in these organs are generally insufficient of themselves to occasion the fully developed complaint; and that, in addition, there are increased sensibility and irritability of the sentient and motive systems, and consequently augmented susceptibility of impressions, from mental or physical causes, arising either from original conformation, or from acquired habit or diathesis; — *e*. That when these states of the generative organs are excited by mental emotions or by other circumstances, the affection is propagated by direct or immediate sympathy, — by the organic nerves, — to the digestive tube and urinary organs on the one hand, and to the cerebro-spinal nervous system on the other; and thus the phenomena constituting the hysterical seizure are developed; — *f*. That the hysterical phenomena, proceeding from *direct sympathy* with the uterine organs, consist chiefly of those referred to the bowels — the borborygmi, globus, &c., and to the urinary organs, as the increased secretion of urine, &c.; — *g*. That the extension of the disorder of the uterine nerves, by means of the ganglial system and its communicating branches, to the roots of the spinal nerves, gives rise to the symptoms depending upon *reflex sympathy* *, especially the convulsions, pains, &c., and the affections of the respiratory organs, throat, head, &c.; — *h*. That the phenomena of the developed states of the disease and of its irregular forms are principally sym-

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* In my APPENDIX *to* M. RICHERAND'S *Elements of Physiology*, published in 1824 and in 1829, I have divided the sympathies into — 1st. The *Reflex*, or those which take place in consequence of irritations conveyed by the nerves to the cerebro-spinal centres, and thence reflected upon motive or sentient parts: — and, 2dly. The *Direct*, or those which proceed more immediately from the seat of primary excitement to other parts, by means chiefly of nervous communication, continuity of membrane, structure, &c. — These views as to sympathy, which are certainly original, were applied to the explanation of the pathology of CHOREA, and its related disorders of CONVULSIONS, EPILEPSY, &c.

pathetic, and of the kind which I was the first to denominate the *reflex* (see *Notes and Appendix to* RICHERAND'S *Elements of Physiology*, pp. 34. and 546.); and the same views and pathological explanations given in the articles CHOREA AND RELATED AFFECTIONS (§ 15—17.), CONVULSIONS (§ 46.), EPILEPSY (§ 51.), apply to the different varieties of HYSTERIA; — *i.* That, although hysteria is often connected with deficient or irregular menstruation, yet this function is sometimes excessive, or is occasionally regular, in every respect, in hysterical persons.

62. X. TREATMENT. — There are few diseases less under the control of medical treatment than hysteria; and various circumstances connected with it often occur to render the management of it not only unsatisfactory, but also unpleasant. Patients themselves or their friends readily suppose that relief should quickly follow a recourse to medicine, and conclude, that the proper means have not been employed, when relief is not obtained. They do not consider, — and the fact is generally not sufficiently explained in the proper quarter, and at the proper time, — that the complaint arises from causes which are mostly permanent in their action, or which continue during the treatment, and that in every case the difficulty of removing an effect, whilst the causes are in operation, is very great. The candid physician also readily admits, that the complaint in its various forms is devoid of danger, and this circumstance is believed by many to imply a speedy cure. Several varieties of it also are calculated to excite alarm; and, if they be not soon removed, the knowledge or ability of the physician, under whose care they may have come, is impeached; and some other advice is asked, and often in quarters noted neither for honesty nor ability. If the patient should thus fall into the hands of either the qualified or the unqualified charlatan, the complaint is misrepresented or exaggerated, and alarm is excited. The effect, however, is often beneficial, although it was as little intended as its source was unsuspected. The impression of fear on the mind may put a stop to some of the causes, or may interrupt the succession of morbid sympathies. The patient, moreover, after she has passed from the care of the scientific practitioner, may be subjected to influences of a powerful nature, moral or physical, or both, and experience temporary or some permanent advantages from them; but from whatever source they proceed, or by whomsoever administered, — whether by the medical empiric, or by the spiritual comforter — the modern worker of miracles, — the results are often equally annoying to the duly qualified practitioner. The regular professor of medicine is expected to administer benefit in all cases, and without regard to circumstances. If he fail, and the patient, under very different circumstances and influenced by very different feelings, receive benefit from the manipulations of a charlatan, whose means are more striking or imposing, or more suited to the moral condition of the patient, than those previously employed, the occurrence is made a matter of notoriety, and equally to the disadvantage of the one, as to the credit of the other. The former is expected by the public to cure, and it is considered discreditable for him to fail; the latter is viewed as having made a wonderful discovery, if he succeed but in a single case, and his knowledge is supposed to have come by inspiration, as it could not have been derived from any other source. Another circumstance further serves to counteract the treatment advised by scientific men, particularly in large towns. The patient is capricious, and her friends are often equally unstable. If benefit is not received in a very short time, the advice of some one else is obtained, and before he can be of any service, he also is dismissed, and a third is called in. Thus, from twenty to thirty practitioners may be consulted without one of them having had a sufficient opportunity of fulfilling a single intention of cure. Now, what is the consequence? The patient resorts to some noted or fashionable empiric, who is informed of her long sufferings, and the want of success of the greatest physicians in her case. He is shrewd enough to see at once the state of matters, and to turn them both to his pecuniary advantage and to his credit. He exaggerates the risk, the difficulty, and the consequences of the disease; refuses to undertake the case, unless at his own terms, which he takes care to secure; and he thus also secures the continuance of the patient under his care, and even her confidence, although he should fail in all beside.

63. From the dishonest acts of charlatans, useful lessons may, however, be honestly learnt. When a physician is called to a nervous patient, who has been under the care of other physicians, instead of prescribing at once, and without reference to this circumstance, he should acquaint her or her friends, that probably a sufficient opportunity of affording relief had not been allowed to those who had preceded him; that, as a member of an honourable profession, he expects to be honourably dealt with, and that he will not compromise his reputation by prescribing for the case, unless he be allowed time and opportunity — fully and circumstantially — for its proper treatment. Unless these be conceded, and in a spirit which will promise to secure their due performance, it will be infinitely better to relinquish the case altogether, than to enter upon the treatment of it, with the probability of disappointment. When it is found that the physician thus regards his own reputation, respect and confidence will be accorded to him by the patient and her friends.

64. There are various circumstances in the pathology of hysteria, which require strict attention in the treatment. — 1st. The particular form of the hysterical seizure, whether regular, irregular, or anomalous; — 2d. The condition of the nervous system, particularly with reference to increased sensibility and irritability; — 3d. The excitement, erethysm, vital turgescence, or other disorder of the uterine system, and their influence by *direct* and *reflex sympathy*; — 4th. The states of the vascular system, in connection with these, especially in respect of *plethora*, general or local, or of deficiency of blood; — and, 5th. The functional or other disorder of the digestive canal. Of all these, the most important is the state of uterine function; for unless the symptoms connected with the generative organs be carefully ascertained, as far as is proper to inquire, and the disorder in this quarter be carefully inferred, the treatment will often be unsuccessful; and, even with the utmost exercise of professional acumen, we may fail, more or less, owing to the permanence of the moral and physical causes of the complaint.

65. i. TREATMENT IN THE SEIZURE. — *A.* If the paroxysm be attended by severe *convulsions*, the principal intention is, *to preserve the patient from injuring herself*; the next is, *to shorten its duration.*— *a.* Although her struggles are severe, she generally retains sufficient consciousness and even volition, to avoid danger. Therefore little effort should be made to restrain them, and especially as they have upon the whole a beneficial effect, particularly in equalising the circulation. If, however, the fit assumes an epileptic character, this object should be carefully attended to, and a folded napkin placed between the teeth, if it be required. In all cases, the patient should be removed to an airy apartment, and the clothes loosened around the waist, chest, and neck. — *b.* In order to *shorten the fit*, various means have been recommended, and found more or less serviceable. If the patient is able to swallow fluids, a large cup full of *cold or iced water* may be given and repeated. If the seizure be more severe, or be attended by general or cerebral plethora, the *affusion of cold water* on the head and neck should be resorted to, or cloths wet with it, or with an evaporating lotion, should be placed around the head. If the severity of the spasms, particularly of the muscles of the face and jaws, and of the strangulating sensation arising from the globus, prevents deglutition, *enemata* will be found of great service. The substances which I have found most efficacious, when thus employed, are, the spirits of *turpentine* alone, or with castor or olive oil, *assafœtida*, and *camphor*. An enema of the coldest spring water also puts an instant stop to the convulsions. The spirit of turpentine was recommended by me in 1821 (*Med. and Phys. Journ.* vol. xlvi. p.107.185.), in these cases. From half an ounce to an ounce and a half of it, may be thus administered, with either of the oils just named, in any vehicle, as gruel, milk, broth, &c. As the patient's consciousness is seldom lost in the seizure, the influence of fear in arresting it has been often resorted to, and frequently with complete success. Even mention of the affusion of cold water has put a stop to the fit. Yet instances have occurred in timid persons of great nervous susceptibility, where fear has aggravated the convulsions.

66. *B.* Where there is neither cerebral plethora nor difficult deglutition, the internal use of *diffusible stimulants*, as the preparations of *æther*, of *ammonia*, of *valerian*, of *assafœtida*, &c., have been very generally recommended, and are often useful, combined, according to circumstances, with one another, or with *anodynes*, as *laudanum*, *henbane*, *hydrocyanic acid*, &c.; the smoke of burnt feathers, and the odour of assafœtida, of mint, of the volatile alkali, of aromatic vinegar, &c., are the common domestic means for the removal and prevention of a seizure. Much, however, particularly as respects the *prevention* of the fit, depends upon the patient herself. Most females, subject to the complaint, give way to the current of their feelings, until the paroxysm is developed, although a determined resolution to prevent or suppress it would often prove successful. Diffusible stimulants are not so generally useful in preventing, as in shortening, the attack. The former of these objects is more certainly obtained by a draught of cold water, or by an enema of the same, or by cold applications to the head, than by other means. Dr. CONOLLY states that he has found half a drachm of ipecacuanha prevent the seizure. Any of the other substances already recommended to be used in enemata, for the purpose of shortening the fit, will generally also prevent it.

67. *C.* The more severe or alarming states of the fit, as the comatose, the cataleptic, &c., are most benefited by the affusion of cold water on the head, or by the application of cold lotions in this quarter. Vascular *depletions* are seldom necessary during the fit, even in these cases, unless the attack has followed the suppression of accustomed discharges; or the temperature of the head, and the action of the carotids show the propriety of prescribing them, and even then a moderate bloodletting, or cupping on the nape of the neck, will be sufficient. Warm and rubefacient *pediluvia*, and other *derivatives* from the head, may also be employed in these cases. The means which may be further resorted to will be stated hereafter (§ 71. 75. 97.).

68. ii. GENERAL TREATMENT, PARTICULARLY IN THE INTERVALS. — *A. With reference to the state of the uterine system.* — The female organs of generation may be subject to that state of excitement, erethysm, turgescence, or irritation, which, in susceptible and nervous persons, seems intimately connected with hysteria, without the catamenia being in any way disordered. More commonly, however, this discharge is scanty, difficult, painful, or irregular as to time, quantity, and character. In a few instances it is suppressed, or nearly so; in others it takes place at intervals of two or three months; in some it is too profuse, or much too frequent, and in many it is pale and branniform, or it presents appearances more fully described in the article MENSTRUATION. But all these states are usually accompanied by more or less of altered sensibility, referrible to the uterus or ovaria: there is often pain behind or above the pubis, in the lower part of the sacrum, or in the loins, or in the hips or tops of the thighs; the excretion of urine is disturbed, or too frequent, or attended by slight scalding, &c.; and there is sometimes leucorrhœa, with tenderness of the os uteri on examination, and occasionally an unpleasant sense of heat in the vagina. All these indicate the propriety of having recourse to local depletions; yet, unless the patient be plethoric, or the discharge has been scanty or suppressed, a very copious vascular depletion is often injurious. A moderate *cupping* on the sacrum; or the application of ten or twelve *leeches* to the groins, two or three days before the expected return of each monthly evacuation, or to the hypogastrium, will generally suffice. If the depletion be more liberal, the employment of tonics and of other means to improve the general health must not be neglected.

69. All the symptoms just noticed as indicating irritation of the uterus, are often present, even in the severest form, where there is great constitutional debility, and, in a few instances, where the colour of the surface and of the lips, and the states of the pulse and of the veins, indicate more or less anæmia. In these, even local depletions may be hurtful. The chief dependence must therefore be placed in preventing local excitement or irritation, in the use of cooling *tonics* sometimes in conjunction with *anodynes* and *sedatives;* and in improving the digestive functions and general health, by

suitable diet and regimen. The *sulphates of iron*, of *zinc*, and of *quinine*, are severally of use, in combination with small doses of *camphor*, or of *ipecacuanha*, and with *extract of henbane*, or of *hop*. If these should occasion headach, or increase the tenderness in the vicinity of the uterus, the *infusion* or *decoction of cinchona*, or the *infusion of valerian* with *nitrate of potash*, or *hydrochlorate of ammonia*, or carbonate of *soda*, may be prescribed. When the bowels require to be opened, the *cooling aperients*, as the bitartrate of potash, with the nitrate, and the confection of senna, should be preferred. Moral and physical *quietude*, frequent reclining on a couch, and a digestible and cooling diet, ought also to be enforced. In more plethoric persons, these means are still more requisite than in the preceding; and, instead of chalybeates and tonics, *cooling diaphoretics*, particularly weak camphor mixture, with solution of the acetate of ammonia, nitrate of potash, and spirits of nitric æther, will be often taken with benefit. Wherever uterine turgescence or erethysm is inferred, the treatment must be directed with reference to the states of general or local plethora, and of nervous power, as hereafter insisted upon; and hot spices, exciting articles of food, and stimulating beverages, should be avoided. Heating purgatives and irritating injections ought not to be employed. A separate sleeping apartment should be suggested.

70. When the catamenia are disordered, the treatment must be directed with strict reference to the state of disorder, as explained in the article MENSTRUATION. If they be *excessive* or *too frequent*, *tonics* and *astringents*, with *refrigerants*, and *anodynes* or *narcotics*, are generally requisite; but the predominant use of either of these classes of remedies should depend upon the peculiarities of the case In these cases especially, advantage will accrue from *cold sponging* the loins, abdomen, and hips, every morning with an *astringent lotion*, as with equal parts of rose water, solution of the acetate of ammonia, and vinegar; from the occasional recourse to an *enema of cold water*, particularly when a seizure is threatened, or to *emollient* and *anodyne enemata* on other occasions; and from rest in the horizontal posture. The *cold plunge* or *salt-water bath*, or *shower bath*, will often also be of service. In the other states of disordered menstruation, the treatment should be directed according to the principles stated above (§ 68, 69.).

71. *B. With reference to the state of nervous susceptibility and tone.* — The increased susceptibility of the nervous system generally characteristic of hysteria is frequently associated with more or less debility, and increased irritability of the moving fibre, — or in other words, with mobility of the muscular system; and to this state, whatever may be other morbid conditions, should the treatment be in some measure directed. Yet the means which are the best calculated to correct this state are by no means obvious: for if it be associated with vascular turgescence of the uterine system, or with general plethora, antispasmodics, chalybeates, and other heating tonics may increase the complaint, although they will generally be of service in an opposite state of the vascular system. In general, therefore, the condition of the sensibility and irritability should be combated chiefly by frequent and *regular exercise* in the open air, by *early rising*, by sleeping in large airy apartments, by cold or *salt-water bathing* or the *shower bath*, by cold sponging the surface of the body, by a proper conduct and employment of the mind, and by a correct management of the passions.

72. Dr. CULLEN very justly remarks, that *tonics* may be of service when the disease depends upon general debility; but as a plethoric state, especially of the uterus, is more or less joined with hysteria, the frequent or long continued use of them may do harm. They should be confined to cases of pure mobility, particularly with a periodical recurrence of the seizure; and then the selection of them ought to be determined by the peculiarities of the case. In many such, the preparations of *cinchona* or of *valerian*, with the nitrate of potash, or carbonate of soda; the sulphate of *quinine* or of *zinc*, with small doses of *camphor;* the infusion of *bark*, or of *roses*, with one of the *mineral acids*, and the tincture of the *sesquichloride of iron*, will be most serviceable. In some cases, the addition, to either of these medicines, of an *antispasmodic*, as of the compound spirit of *sulphuric æther*, the *tincture* of *valerian*, &c.; and of an *anodyne*, as henbane, hydrocyanic acid, &c., according to the other substances selected, will be further advantageous. When hysteria affects plethoric habits, and is connected with manifest signs of turgescence of the generative organs, *opium* is injurious. But, in other circumstances, it is often of service, particularly when conjoined with camphor, aromatics, or with some of the substances just named, but even then it should only be occasionally employed. When narcotics have not been previously resorted to, the preparations of *hop* will be found useful, if general plethora be not present.

73. *C. With reference to the states of the vascular system.* — The connection of hysteria with vascular plethora, general or local, is often obvious; and has been very judiciously viewed by Dr. CULLEN. The usual practice of removing this state by *bloodletting*, he remarks, is often precarious; for sometimes, instead of preventing, it will indirectly induce or increase vascular fulness. Besides, if depletion be carried too far, the complaint may be thereby increased. "Venæsection therefore may either increase the plethora, or induce inanition; and it is only to be used in recent cases, and where there is manifestly a full habit." A *spare diet* and *regular exercise*, particularly in the open air and in the light of day, *early rising*, and *cooling aperients*, are the means upon which the chief reliance ought to be placed in removing this state, and especially as they tend also to strengthen the nervous system, and to prevent local turgescence and irritation. The frequent association also of dyspepsia, and of gastro-intestinal disorder with hysteria, renders this regimen still more necessary. When depletion, however, is indicated by the turgescence, or chronic inflammatory state of the uterine organs, or by impaired or obstructed menstruation, it should be practised in the manner already advised (§ 68.).

74. When the vascular system is deficient, rather than too full, of blood, and when this fluid seems thin or poor (the *Hysteria chlorotica* of SAUVAGES), then *tonics*, especially the *preparations of iron* and *chalybeate mineral springs*, will be most beneficial; but they should be aided by air and exercise, and the other means already advised for improving nervous energy (§ 71.). The sulphate of iron with the extract of hop, or with the compound galbanum, or with the compound aloetic

pill, according to the states of the bowels and of the catamenia; the compound mixture of iron, &c.; and a moderately nutritious or milk diet, will be eminently beneficial in these cases. If the patient complain of weaknes in the loins and limbs, a large *plaster* of the red oxide of iron, or the aromatic plaster, should be worn on the lumbar region, in addition to the employment of the other means already recommended.

75. *D. With reference to the state of the digestive organs.*—Irritation of the digestive mucous surface, in connection with hysteria (§ 52.), is often most successfully treated by a mild spare diet and moderate exercise in the open air. If the patient be plethoric, or complains of pain or soreness, or of tenderness in the epigastrium, abdomen, or hypogastrium, *local depletions*, particularly the application of leeches on the abdomen, and *cooling diaphoretics*, with external *derivatives*, will be appropriate, as respects both the digestive and the hysterical disorder. If the bowels be costive, the *cooling aperients* (F. 96. 790.), or the preparations of *rhubarb* with *ipecacuanha*, *calcined magnesia*, or *castor oil*, will be useful. If they be relaxed, the *hydrargyrum cum cretâ*, with *rhubarb* and *ipecacuanha*, — or this last with the *extract of hop*, or of *poppy*; and *refrigerants* conjoined with *demulcents*, will be serviceable. In cases of *hysterical colic*, and of irregularity of the bowels in hysterical persons, a frequent recourse to *enemata*, — to those consisting of cold or of emollient fluids, and sometimes of cooling aperients,—will generally prove of great benefit. When the catamenia are at the same time disordered, clysters containing the spirit of turpentine are frequently very useful. The state of the digestive organs often requires *tonics* and *stomachics*; but these remedies may prove too stimulating, unless they be given with *refrigerants* and *antacids*, as with the nitrate of potash, and the carbonate of soda. Aloetic and heating or acrid purgatives, particularly those which excite the rectum and large bowels, are sometimes injurious. The propriety of exhibiting them, even when hysteria is associated with scanty or obstructed catamenia, is occasionally even doubtful, particularly when general or local plethora, or excitement, is present, unless these have been removed by suitable depletions; and then the *compound decoction of aloes*, with a little of the solution of potash, may be preferred. When flatulence is distressing, as it often is, the treatment should altogether depend upon its connection with gastro-intestinal irritation, or with uterine excitement or turgescence. In the former case, the means just stated should be prescribed, aided by the application of a *large rubefacient plaster*, or the compound galbanum or pitch plaster, on the stomach or abdomen. Mint water with calcined magnesia, and an aromatic or carminative, or the infusion of *calumba*, or of *chyrita*, with the carbonate of soda and compound tincture of cardamoms, will generally also be serviceable.

76. iii. TREATMENT OF THE IRREGULAR AND COMPLICATED STATES. — The *intentions of cure* in these states of hysteria, are — 1st, *To remove existing disorder in the uterine and digestive organs, or in the cerebro-spinal centres*; — 2dly, *To allay the local affection, by means appropriate to its peculiar characters*;—and, 3dly, *To make a forcible impression, mentally and physically, on the nervous system*, so as to allay the primary nervous affection, and to break the chain of nervous sympathy. These intentions are severally more or less applicable to all the nervous states about to be noticed; but a great difference will be shown to exist in the modes or means of their fulfilment, and in the dependence to be placed upon them individually.

77. *A. The painful affections depending upon this complaint*, or arising from irritation or turgescence of the uterine organs, influencing sympathetically (§ 13.) related or distant parts, require means, in some cases at least, different from, or additional to, those already mentioned.—*a.* The treatment of *Hysterical headach* is fully stated in the article HEADACH (§ 40.).

78. *b. Pain in the left side of the thorax, simulating pleuritis*, or *pericarditis* (§ 15.), is difficult to remove, especially if there be tenderness in the dorsal portion of the spine, and disorder of the uterine functions. If the catamenia are scanty, and especially if there be more or less vascular plethora, cupping on the loins or sacrum, or the repeated application of leeches to the loins, and cooling or mild purgatives, will be necessary. In other circumstances, and in such cases, after these means have been employed, the effects of *antispasmodics* and of *narcotics* may be tried, especially of camphor or ammonia, with valerian or assafœtida and henbane, &c. If the pain be attended by *palpitations of the heart*, &c., the decoction of senega may be prescribed with mint or orange-flower water, carbonate of soda, and tincture of henbane; — or camphor may be given in a mucilaginous mixture with hydrocyanic acid. Immediate relief is often obtained by applying on the pained part a piece of flannel wrung out of hot water, and sprinkled with spirit of turpentine, or with the following liniment: —

No. 261. ℞ Linimenti Camphoræ Comp., Linimenti Terebinthinæ Comp., āā ℥j.; Olei Cajuputi et Olei Limonis āā ʒj. M. Fiat Linimentum vel Embrocatio.

These embrocations should be covered by a dry cloth, or by wash-leather, to prevent evaporation, and be kept applied to the affected part until they occasion redness and burning heat of the integuments. I have seen the pain removed also by the inner bark of the mezereon, previously moistened and softened, and kept applied to the part until a superficial sore was produced. — If pain or tenderness in the spine be also complained of, the means about to be noticed (§ 85, 86.), may be prescribed.

79. *c. Hysterical pain in the regions of the stomach and spleen* (§ 17.) often resists medicine, and disappears spontaneously, especially after marriage, or from changes in the states of the uterine system. It is sometimes relieved by camphor conjoined with hydrocyanic acid or with the acetate of morphia, or by the other antispasmodics and anodynes mentioned above (§ 78.). The warm epithem and embrocation, just recommended, has, however, proved most successful in my practice. Large doses of the subcarbonate of soda, with a carminative mixture or spirit, and tincture of henbane or of opium, often afford relief. An enema, containing either the spirit of turpentine and castor oil, or assafœtida and confection of rue, generally proves very serviceable.

80. *d. When pain is severe in the region of the descending colon and left iliac region* (§ 18.), or in *other parts of the abdomen*, with flatulent distension, increased sensibility, and other symptoms

resembling *peritonitis* (§ 21.), the above treatment is more to be depended upon than any other. The warm epithem or embrocation should never be omitted. The enema just prescribed will seldom fail of emptying the large bowels, and of expelling the flatus which is a chief cause of the more painful symptoms. When the complaint assumes the form of *hysterical colic*, the bowels being costive, these means are usually eminently successful. They may require, however, to be repeated. If palpitations be present in these cases, they depend upon, or are aggravated by, the flatus which often rises up into the œsophagus, and, by distending a portion of this canal, embarrasses the auricles of the heart. Hence the benefit which results from the means which are most efficacious in expelling the flatus, particularly from those just named; and from calcined magnesia, prescribed with antispasmodics and carminatives, or warm purgative tinctures. — *For pain in the region of the liver* (§ 30.), the treatment here advised will be appropriate. In all these states of the complaint, the bowels should be kept moderately open by mild or stomachic purgatives.

81. *e. When pain is seated behind, or just above the pubis* (§ 20.), and particularly when it extends to the sacrum, to the os coccygis, or when it implicates the urinary bladder, or its functions, irritation, or vascular turgescence, or congestion of the uterus, may be inferred. Local depletions ought then to precede other means; and the mode, amount, or repetition, of depletion, should depend entirely on the habit of body of the patient, and the state of the catamenia. After those have been prescribed, the bowels must be evacuated by mild or stomachic purgatives, and the circulation equalised by cooling diaphoretics and anodynes. Camphor mixture, almond emulsion, solution of acetate of ammonia with nitrate of potash, spirits of nitric æther and tincture of henbane, are generally useful in these cases. But if the pain still continue, the external means above advised, and the enemata (§ 78, 79.), should be resorted to.

82. *f. Pain in one or both mammæ* (§ 29.) is sympathetic of irritation or turgescence of the uterus or the ovaria; but it is sometimes associated with tenderness of one or two of the dorsal vertebræ. It is often removed by the treatment now prescribed. If there be scanty menstruation, leeches may be applied to the mammæ; but the tops of the thighs, and hypogastrium, are preferable situations. I have found cooling diaphoretics with narcotics, as the solution of the acetate of ammonia, and camphor julep, with the acetate of morphia and an aromatic spirit, very serviceable in this state of disorder. In a case of this kind, where there were remarkable tenderness and hardness of the left mamma, evidently depending upon uterine irritation and turgescence, and for which I was consulted by another practitioner, complete recovery followed a short course of the solution of the iodide of potassium in camphor mixture, to which the solution of potash and henbane were added. If tenderness exist in any of the dorsal vertebræ, the treatment advised for this complication (§ 85.) should also be pursued.

83. *g.* In the *more acutely painful or neuralgic affections* connected with uterine disorder, the effect of a plaster with the extract of belladonna and camphor may be tried. But when they are associated, as sometimes observed, with pain or tenderness in some portion of the spine, then the other local means about to be noticed may be also employed. I have seen the most marked benefit result, in these more acute cases, from half an ounce each of spirits of turpentine and castor oil, taken on the surface of milk, and repeated once or twice after the intervals of a day or two; or from a full dose of the former medicine, followed by the enema already mentioned (§ 79.), or by any suitable purgative. Repeated doses of turpentine, until either the kidneys are affected, or the bowels are entirely evacuated, and enemata containing a considerable quantity of this substance, will be found the most efficacious, when painful affections, connected with hysteria, are seated in, or extend to, the lower extremities.

84. *h. Pain in the region of the kidneys, and in the course of the ureters* (§ 22.), is evidently an extension of irritation from the uterus to these organs by direct sympathy, — a considerable portion of the nerves of the generative and urinary organs belonging to the same ganglia. The treatment should, therefore, be chiefly directed to the state of the uterine system. Local depletions will sometimes be requisite, especially if there are general or local plethora, and scanty menstruation. The fixed alkalies or the alkaline subcarbonates, with anodynes and the spirits of nitric æther or the compound spirits of juniper, will occasionally be of service, especially when the urine deposits a sediment of uric acid in the form of sand. When the urine is higher coloured, or deposits a pink or amorphous sediment, consisting chiefly of the lithate of ammonia, the infusion or decoction of cinchona with hydrochloric acid, or the balsams taken in the form of pills with magnesia, will be found beneficial. The digestive functions should receive due attention. A rubefacient, stimulating, or roborant plaster applied on the loins, as the aromatic, cummin, pitch, or ammoniacum plaster, will often also afford some relief.

85. *i. Pain in the spine* (§ 23.) is rather a complication, than a form, of hysteria; and is not to be viewed as altogether, or always, depending upon inflammatory action or irritation; but rather upon excited sensibility. There is no doubt that vascular excitement or congestion often exists in these cases, especially where there is much tenderness or prominence of one, two, or more of the spinal processes, or puffiness around them. In these cases, especially, there is more or less continued disorder of the uterine, or of the digestive, or of the respiratory functions, or even of all of these, according to the seat and extent of the spinal affection; and occasionally the cerebral circulation becomes also deranged. To this affection, DARWELL, TEALE, TATE, BROWN, and GRIFFIN have directed particular attention, under the name of *Spinal Irritation*, or, more properly, irritation of the spine, and have recommended for it local depletions and external irritants, &c. But whoever confides in these alone, or even principally, will find himself disappointed in many, if not in the majority of cases. They often, however, are important parts of the treatment, especially if plethora, general or local, or scanty menstruation, exists. In cases of this description,

the digestive functions should receive strict attention, the bowels being kept regularly open. In the majority, and particularly if there is debility or deficiency of blood, or too frequent or too copious menstruation, the sulphate of quinine, with camphor and extract of hop, or extract of hyoscyamus; the preparations of cinchona, with the alkaline subcarbonates, or with the mineral acids, according to circumstances; and the preparations of iron; will prove of great service, if appropriately administered. In some instances of the association of hysterical affection with tenderness of the spine, and with neuralgic pains in the corresponding nerves, I have found, after local depletions and alvine evacuations, pills containing full doses of the sulphate of quinine and sulphate of iron, with camphor and extract of hyoscyamus, very beneficial, and have added the purified extract of aloes to them with advantage, when the bowels were costive, or the catamenia deficient. Where the powers of the constitution are not impaired, or where there is excited action, an occasional recourse to the draught with spirits of turpentine and castor oil, or to the enema containing the same substances, will be of essential service.

86. *External means* of various kinds have been applied to the spine in these cases, often without benefit, sometimes with detriment, particularly when the increased sensibility depended upon sympathy with other parts, and upon great nervous debility. When there is sufficient evidence to infer that inflammatory irritation and turgescence have been excited in the membranes or investing structures of the spinal cord, then certain of these applications, as leeches, scarification and cupping, the tartarised antimonial ointment, or issues, will be more or less beneficial; but in other circumstances they will be of no service. The relief which has followed the application of blisters, or of rubefacient and stimulating plasters, is no proof that the morbid sensibility of the spine depended in these instances upon inflammatory excitement or vascular turgescence; for, if these morbid states had existed in any degree of sthenic activity, these applications were more likely to have aggravated, than to have removed, them. Where they have actually given relief, there is reason to infer that the morbid condition was one of deficient vascular and nervous energy, rather than the reverse; and one for which general restoratives or tonics, as well as local excitants, were required. Much attention to the states of the various functions, particularly of those of the abdominal and pelvic viscera, and great discrimination, are necessary in these cases, to determine aright as to the local means appropriate to the various conditions of this class of affections. There are some applications which will not be injurious under any circumstance, but will be serviceable in many. The chief of these are the warm terebinthinate epithem and embrocation already noticed (§ 78.), applied over that part of the spine, chiefly, where pain is felt. Plasters, also, consisting chiefly of ammoniacum, compound pitch, or of red oxide of iron, &c., will subsequently prove useful. Where signs of inflammatory action of the ligamentous or other structures of the spine are present, the above liniment, epithem, or embrocation, applied to the affected part; and setons, issues, or open blisters, some distance below it, so as to produce a derivation from the seat of morbid action; will frequently afford great relief.

87. *k. Pain in the sacrum and os coccygis* is generally not to be imputed to the same morbid states, as that referred to the spine. It frequently depends upon the condition of the uterus, particularly about the *os* and *cervix uteri*, and requires the same treatment as that advised for pain behind or above the pubis (§ 81.). Whether proceeding from this source, or from disorder near the origins of the nerves, or from disease of the structures of the spine, or of adjoining parts, the means just recommended, constitutional as well as local, will be useful when judiciously employed.

88. *l. Hysterical affections of the hip or other joints* (§ 26.) are very difficult to manage, and require, for their removal, not merely an improvement of the general health, but also strong impressions upon the mind and nervous system. The *intentions of cure* above stated (§ 76.), should be fully followed out, and the particular means already described fairly tried. The medicines which I have found the most successful are — the *spirits of turpentine**, prescribed in various modes, internally and externally, and administered in enemata; the *preparations of iodine*, alone, or with *narcotics*; and *camphor*. These, however, should be associated with suitable adjuvants; amongst which, the several *narcotics* and *antispasmodics* are the most important. The warm or vapour bath, simple or variously medicated; mental excitement, and exercise taken regularly and energetically; and employment of the mind; are also important aids in the treatment. The affections of the joints are sometimes accompanied, or even alternated, with severe nervous pains in the extremities, and occasionally with tenderness in some portion of the spine. In such cases, the treatment hardly requires any material alteration. In those which have come under my care, I have very frequently prescribed the spirit of turpentine, as already stated (§ 83.), and often repeatedly in enemata; and, after two or three doses of it, I have commenced with the preparations of iodine, conjoined with henbane, opium, or belladonna. Whilst the iodine has been given, the turpentine has been administered in enemata, from time to time; and the embrocation or liniment above described (§ 78.), assiduously employed. In recent cases, particularly when the knee-joint was affected, this treatment has removed the disorder in a few days. In the case of a lady, whom I saw with Mr. FAXON, the complaint in this joint was almost instantly removed by the warm turpentine epithem applied around the knee. Various other medicines may be tried, and, indeed, require to be tried, before some of the foregoing will be submitted to by the patient. Most of the cases which I have seen, have been very obstinate, and have been treated by the more usual remedies, as the mineral sulphates, the preparations of iron, the sulphate of quinine, narcotics, &c., before I saw them. Sir B. BRODIE mentions favourably a

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* The spirit of turpentine was first recommended by the author for these states of hysteria, and for neuralgic and similar affections. It has recently been advised for the same complaints by some French physicians. The originality of the practice may be known, by referring to *A Memoir on the Employment of Terebinthinous Remedies in Disease*, by JAMES COPLAND, M.D. &c., published in the *Lond. Med. and Physical Journal*, for July and August, 1821, p. 107—193.

long continued course of the sulphate of copper in small doses. The external application of the vegetable alkaloids, and of their salts, particularly veratria, aconitina, &c., in ointments or liniments, has recently been recommended for cases of this description, and particularly for those attended by neuralgic pains, in much stronger terms than the real advantage derived from them warranted. I have prescribed these preparations in several instances of this kind, and have had the prescriptions prepared by the very best chemists, but permanent advantage was seldom derived from them.

89. Local hysterical pains will sometimes be relieved by friction with a stimulating liniment containing some narcotic (F. 297. et No. 261.) Sir B. BRODIE recommends a lotion consisting of equal parts of spirit of rosemary and camphor mixture to be applied tepid to the affected part. The simple exposure of the part to the vapour of hot water — the heat and vapour being confined by oil-skin, or by any other means — will often be useful. The vapour bath, employed thus locally, will be still more serviceable when the affected limb is cold, or is alternately hot and cold. It has been recently prescribed by Dr. J. WILSON in these and similar affections. (*Pract. Treat. on the Curative Effects of Simple and Med. Vapour applied locally, &c.* 8vo. Lond. 1837.) — Sir B. BRODIE states, that he has found the hysterical painful affections characterised by alternations of heat and cold, much relieved by the following plan: — "During the hot fit, let a compress be applied wet with a cold spirituous lotion; and when the heat has subsided, let a thick woollen stocking be drawn over it, and then an oiled silk covering over the stocking, so as to confine the heat and perspiration. When the cold fit has subsided, the oiled silk covering may be removed. This treatment, however, should be combined with the exhibition of the sulphate of quinine." I have found the quinine more beneficial when given with camphor in these cases. The oxides or carbonates of iron may also be tried in electuaries; and conjoined with the confection of senna or of scammony, when the bowels are costive.

90. *B. When hysteria assumes anomalous spasmodic forms, or stimulates other spasmodic affections* (§ 31.), the same principles of treatment as have been already explained should be adopted, according to the states of general or local vascular plethora, and of uterine function, and to the symptoms referrible to the spine. There are few cases of this kind in which the spirits of turpentine, judiciously prescribed, or administered in enemata, will not prove of essential benefit; and some will require, in addition, the warm epithem, liniment, or embrocation, already described (§ 78.). But these can often be resorted to only at considerable intervals. The tonics, antispasmodics, and anodynes, — the general plan of treatment recommended, — must be duly exhibited; and if evacuations be necessary, they should be resorted to as above directed. In most respects, these affections require nearly the same *indications of cure*, and the *same means* to fulfil these indications, as have been directed for the more painful complaints just passed under review, and particularly for those seated in the joints and extremities.

91. For *hysterical cough* or *asthma*, antispasmodics with anodynes or narcotics are very useful. The preparations of valerian with ammonia or camphor, and henbane; a weak decoction of senega with emollients and hydrocyanic acid; small doses of ammoniacum, assafœtida, or of squills, with demulcents; the alkaline subcarbonates and extract of poppy, &c.; will severally be found of service. The treatment, however, must be modified, as previously advised, according to the states of the constitution and habit of body, of the catamenia, and of the temperature of the surface. The *external means* described above (§ 86.), will very materially assist the internal remedies; and sometimes the warm bath will be useful. — In *hysterical hiccup*, camphor and other antispasmodics, with anodynes, and the means just noticed, cold fluids, and cold enemata, will be found advantageous. (See also the *Treatment* advised for CONVULSIONS, and for CHOREA AND ITS RELATED AFFECTIONS.)

92. *C. The comatose, cataleptic, or soporific states of hysteria* (§ 33.) require but slight modifications of either the indications or means insisted upon above. During these states, the remedies advised for the paroxysm may be employed, appropriately to the local or general states of the circulation; and the most important of these are cold affusions or cold lotions on the head; and, in some instances, enemata of cold water, or containing the spirit of turpentine, or assafœtida, or camphor. Subsequently the treatment should be directed according to the state of the cerebral circulation. In most cases of this kind, the disorder of the uterus has excited, or otherwise deranged, the circulation in the brain; but generally in such a manner as to be relieved by the shower bath, or by frequently sponging the head with cold fluids. Due attention to the states of the bowels and of the catamenia, and the other means advised for CATALEPSY and CATALEPTIC ECSTASY (§ 18.), are necessary for cases of this kind. When hysteria assumes the form of *syncope* or *leipothymia*, sprinkling the face with cold water; the *cold douche*, or affusion on the head; volatile or empyreumatic vapours, held at some distance from the nostrils; bathing the face and neck with aromatic waters or spirits; pure air, &c.; are the chief means of restoration; after which the treatment must be conducted as above.

93. *D. Paralytic affections and aphonia* (§ 35.) hardly require any notice as respects the treatment, as the *indications* and *means* of cure already prescribed, are equally appropriate for them. After the bowels have been freely evacuated, and local irritations or congestions removed, a resolute exertion of volition, exercise in the open air, and mental and bodily employment, as far as they can be pursued, are especially beneficial in them, particularly when aided by a judicious administration of tonics or antispasmodics; by suitable diet and regimen (§ 100. *et seq.*); and by recourse to external remedies—particularly to frictions of the surface with stimulating and rubefacient liniments, to warm or medicated baths, &c.—When the paralytic state is manifested chiefly in the alimentary canal or urinary bladder, enemata containing the spirit of turpentine, or the warm terebinthinate epithem, or embrocation, applied over the abdomen, will be found almost immediately efficacious.

94. *E. Hysterical disorders of the mental faculties* consist not merely of the states already men-

tioned (§ 38.), but of others, of a less decided, but not less morbid, kind. Hysterical females are not merely capricious or whimsical; but they often become enthusiastic for a time, in the pursuit of an object, or in cherishing an emotion by which they have been excited. In many such cases, the nervous excitement and vascular turgescence of the uterine organs determine the character of the mental disorder; elevating certain of the moral sentiments, or of the intellectual manifestations, to a state of extravagance, passing, in some instances, into delusion or monomania. Many cases of puerperal mania are merely extremes of the hysterical disorder of the moral and intellectual powers or states of the mind. All these more extreme forms of mental affection are observed only where, in connection with much local or uterine irritation, there is great deficiency of nervous energy generally, and of mental power in particular; or where, with such deficiency, there has been either much injudicious culture, or perversion, or improper excitement, of the imagination.

95. Females sometimes become passionately attached to an object; and this passion may advance even to nymphomania or monomania. The same person, on experiencing a disappointment in her affection, or if she be placed in circumstances entirely preventing the enjoyment of her passion, often becomes enthusiastically religious, especially if powerfully excited by popular preachers. After field preachings, or other ministrations of an exciting kind, the most hysterical females, especially those who have experienced the fully developed fits on these occasions, have become, at least for a time, the most religious. In this, however, there is little to regret: there is no harm, and generally much good, from this direction of the feelings; unless, indeed, advantage be taken of this excitement by certain Tartuffes, especially at lovefeasts, &c., — a circumstance by no means rare.

96. The hypochondriacal feelings, the desire to deceive, or to simulate various diseases, or the delusions, which sometimes possess the minds of hysterical females, may be classed with the foregoing, as requiring a similar plan of treatment. In all of them, the *intentions of cure* are — to remove irritation or vascular turgescence of the uterine organs; to improve the general health; to strengthen the nervous system; to calm the imagination; and to guide the moral impulses of the patient. The means by which the physical portion of these indications are to be fulfilled, have been sufficiently explained. The most efficient, however, of these means are not likely to be adopted by the patient, if she is entirely uncontrolled by friends. Few will resort daily to the shower bath, or even occasionally to terebinthinate enemata, or submit to a course of tonics, or to a suitable regimen, &c., whilst she believes her health but little affected. Even when the hysterical disorder is of a very painful kind, the variability or capricious state of her mind leads her to run from one physician to another, before opportunity of administering aid is afforded to any. At last, the most notorious charlatans, particularly those who either excite the body through the mind, or the mind through the body, — the animal magnetisers, the Homœopathists, the St. John Longs of rubbing celebrity, and the Campbells of celestial-bed notoriety, — fix her attention. At such medical bagnios there is something promising gratification as well as excitement, and at such places hysterical as well as hypochondriacal patients "most do congregate."

97. iv. Of the Prophylactic Treatment of Hysteria. — *a. The avoidance of the occasional causes* is the chief part of this treatment; and this is very difficult. The moral emotions and desires constitute the principal of these causes, and the prevention of them is not in the power of the physician; and, considering the general frailty of our nature, rarely in the power of the patient. — A physician, sufficiently acquainted with human nature, and with human life and society, will frequently discover the connection of the complaint with the feelings, and be able to give useful hints to the patient or her friends, as to the moral as well as to the medical management of the complaint. But his proper business is to correct the predisposing or constitutional cause, and to enable the patient to resist the exciting causes. An indolent, a luxurious, and an unoccupied life, leads to late hours in bed, to an excited state of the imagination, to susceptibility of the nervous system, to irritation and turgescence of the generative organs, and to general or local plethora. It cannot be sanguinely hoped, that females will relinquish ease, luxury, and enjoyment, from the dread of a distant and contingent ill. Most physicians of experience must have often observed the influence of these causes on the health, and have met with instances of females, who, when in ease and luxury, were subject to hysteria, having become entirely free from it, when reverses of fortune obliged them to employ both mind and body.

98. *b.* Much depends upon the *moral* and *physical* education of females about the period of puberty, in preventing hysteria. If more time were devoted to air and exercise, and less to mere accomplishments — if less strenuous efforts were made to cram much ill-assorted knowledge into the mind, in a very limited period — than usually is the case in the present day, an improved state of nervous energy, and of constitution generally, would result. There would consequently arise a race of females, possessed of stronger minds, and better able to make good wives and healthy mothers, than those too frequently met with in the easier ranks of life.—Of all the physical influences, by which the human constitution is permanently impressed in early age, there are none so powerful as *light*, *air*, and *exercise*. Females, while the frame is being developed, should strictly observe early hours, so that the *period of repose* should never be prolonged much after the dawn of morning. The propriety of *sleeping* in a large, well-ventilated room, cannot be disputed. It will be prudent, where more than one must sleep in the same apartment, to have separate beds, each no larger than is necessary for one person; and if the room is sufficiently large and airy, three, but no more, should sleep in it, preferably to two. When very early rising is enforced, the kind of bed, on which growing females should sleep, is not very important, although a hair mattress is perhaps the best; but the bed-clothing should be light, and the sitting, as well as the sleeping, apartments ought to be moderately cool and airy.

99. The kind of exercise which is most serviceable, is that taken in the open air and in the light

of day, and which brings into action the voluntary muscles generally, especially those of the lower extremities. It should preferably be on foot, and be regular, daily, and neither too little nor excessive. SYDENHAM, FULLER, MANDEVILLE, and MANNING advise riding on horseback, as affording the briskest motion, and occasioning the least fatigue. It ought always, however, to be used when the stomach is most empty; for, after a full meal, it retards digestion, rendering it uneasy and flatulent. It is most serviceable when hysteria is associated with retention of the menses, and a chlorotic state of the system, or when there is torpid action or obstruction of the digestive and abdominal viscera. In cases of this description, the advice given by MANDEVILLE will be found of great benefit. This is, to rise before six; to have half an hour's exercise in a swinging chair, flying horse, or the common swinging rope, and then breakfast; some time afterwards to get on horseback, for at least two hours, either galloping or trotting, as much as her strength will permit her; and, immediately after this, to be undressed, and assiduously chafed or dry-rubbed for a considerable time, till her skin looks red, and her flesh glows all over. MANNING observes, that frictions are useful, not only in the cure of the paroxysm, but also as a prophylactic. He directs them to be used on the extremities and trunk of the body, and especially on the abdomen when the digestive organs are weak. If hysteria be attended with the anomalous symptoms already noticed, or assume an irregular form, friction applied daily and assiduously along the spine, will be of great service. Sailing has been recommended by Dr. GILCHRIST, in the treatment of hysterical and other nervous complaints; and in certain circumstances it will be found useful.

100. *c. Cold bathing*, particularly salt-water bathing and the shower bath, will generally be serviceable at this period of life, if females have no particular dread of either, and if the surface of the body be afterwards well rubbed, and smart exercise immediately taken. For delicate constitutions, with a predisposition to the disorder, it will be preferable to commence with a warm salt-water bath, or with a tepid shower bath, the temperature being gradually lowered to the usual grade. Sponging the surface of the body also, every morning, with salt and water, or with water containing some vinegar or a little of the nitro-muriatic acid, the temperature being at first tepid, but gradually reduced to the usual mean of cold, will generally prove most beneficial, not only in preventing the complaint, but also in removing it.

101. *d.* Various *mineral waters* frequently prove of great advantage in the preventive, as well as in the curative, treatment of hysteria. There is no doubt of the *Bath* waters being often beneficial in this complaint, although fashion has brought them into disuse, by bringing others into more general notice than they deserve. In females of a delicate constitution, with a languid state of the circulation, and want of tone of the nervous and muscular tissues, these waters, with proper management, will generally be most useful. In a similar state of system, the mineral waters of *Vichy*, *Barèges*, *Marianbad*, *Eger*, *Carlsbad*, *Pyrmont*, *Spa*, *Hartfell*, and *Tunbridge*, will also be of great service, if employed appropriately to the pathological peculiarities of the case. The stronger chalybeates, however, should not be prescribed when the complaint is connected with general plethora, or where there is very marked vascular turgescence, or excited action of the generative organs. Where these waters are indicated, as well as in more doubtful cases, the springs of *Ems*, of *Bath*, and of *Seltzer*, will often be very beneficial. Seltzer water with warm milk may be used as the common beverage in most cases. As most of these waters may be procured in London and Brighton, there can seldom exist much difficulty in trying them, without leaving this country, or even the patient's home. The warm mineral waters can, however, be used only in *Brighton*, where they are prepared in a way not much inferior to their natural state. — In connection with the use of suitable mineral waters, *change of air* will be most beneficially prescribed. Indeed, much of the benefit attributed to the former actually proceeds from the latter; and in all cases where benefit is derived, both means are concerned in producing it.

102. *e.* The *diet* of hysterical females, as well as the medicines prescribed, should have strict reference to the states of the vascular system and of the uterine organs. In general, a milk diet, as advised by SYDENHAM, is very serviceable, particularly where debility is present; but much animal food is hurtful, especially where there is a tendency to plethora. A fish diet, and the use of shell-fish, are not less injurious, as favouring uterine turgescence, although much less productive of vascular fulness. A spare and cooling diet, consisting chiefly of farinaceous substances, is the most generally appropriate; but a somewhat liberal use of animal food is occasionally requisite. Slops, as weak tea, should be avoided. Boiled milk and bread should be preferred to either tea, chocolate, or coffee. The last is generally too heating, and ought not to be allowed, when the symptoms of uterine turgescence or irritation become very prominent.

103. *f.* Patients subject to hysteria should avoid warm apartments, and crowded rooms or assemblies. The extremes of *temperature* are often injurious to them. They should preserve their extremities warm, and be careful not to confine any part of the body, and particularly the waist, by too strait clothes or stays. — Mental and physical *occupations* are amongst the most beneficial means of treatment in this complaint; and advice respecting them should never be overlooked by the physician. The nature or kind of employment must entirely depend upon the circumstances and condition of the patient. The reading of exciting novels and of loose romances, and even music, are mere dissipations of time. The former ought not to be permitted by those who have the power of preventing it: and the latter should be subjected to a judicious control, and cultivated truly as an accomplishment, and as a relaxation from severer, and more rational, and more useful occupations.

104. As to advising marriage for young hysterical females, this, perhaps, may be as well let alone, although I do not altogether agree with MANDEVILLE, as to the risk of their children inheriting the complaint. He remarks, " in the first place, it may fail, and then there are two people made unhappy instead of one; secondly, it may but half cure the female, who may have half a

dozen children that shall inherit it. A physician has a public trust reposed in him: his prescriptions, by assisting some, ought never to prejudice others; besides, a young lady may not marry so well whilst she labours under this infirmity, as if she was in perfect health. Therefore, let her either be first cured, and then marry without being injurious to herself, her husband, or her posterity; or else remain single, with this comfort, at least, in her affliction,—that she is not liable to entail it upon others, who should be no less dear to her than herself." A principal reason for hysterical mothers having children that are hysterical and nervous, is, that they are generally bad nurses,—their milk being either deficient, or innutritious: when their infants are suckled by strong and healthy nurses, no such hereditary influence is usually observed. Nothing is of greater advantage in hysterical disorders, than mental tranquillity and cheerfulness. Fear, grief, and anxiety ought to be avoided, and the mind should be agreeably entertained and interested by useful employment.

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HYSTERITIS. See Uterus—*Inflammations of.*

JAUNDICE. — Syn. *Icterus* (from Ικτερος, the golden thrush, the sight of which was supposed by the ancients to cure the disease), Pliny, Cælius Aurelianus. *Morbus Regius*, Celsus, Pliny. *Morbus Arquatus*, *M. Arcuatus*, Columella, Celsus. *Aurigo*, Plautus, Varro.

Cachexia Icterica, Hoffmann. *Icterus*, Boerhaave, Linnæus, Cullen, &c. *Cholelithia Icterus*, Young. *Icteroides, Fellis Suffusio, Fellis Obstructio, Icteritia*, Auct. var. *Jaunisse, Ictère*, Fr. *Die Gelbsucht*, Germ. *Iterizia, Citrinezza*, Ital.

Classif. — 3. *Class*, Cachetic Diseases ; 3. *Order*, Cutaneous Diseases (*Cullen*). 1. *Class*, Diseases of Digestive Function ; 2. *Order*, Affecting the Viscera (*Good*). IV. Class, I. Order (*Author*, in *Preface*).

1. Defin. — *Yellowness of the eyes and skin, sometimes passing to a yellowish-green hue, or even to a greenish brown ; the urine being of a saffron or deep colour, the stools generally pale, and the course of the bile obstructed.*

2. There are few diseases, the nature and morbid relations of which have occasioned greater diversity of opinions than jaundice. By some it has been viewed as a symptom of derangement, or of organic lesion, of the biliary apparatus, more immediately dependent upon obstructed discharge, and upon absorption, of bile. Others have considered it as independent of absorption of this secretion, and as the result of a morbid state of the capillary circulation. These, as well as other opinions, will be more fully noticed in the sequel ; and I shall then show that it cannot be considered merely as a symptom of the morbid states of the biliary apparatus, to which it has commonly been attributed, although very often connected with, and sometimes originating in, these states. It occasionally appears in the course of bilious fevers, when there is no obstruction to the evacuation of bile. But the yellowness observed in the last stage of yellow and malignant fevers is not a symptomatic jaundice, the change of colour depending, in these maladies, upon the morbid state of the blood, and upon the change in the capillary vessels and circulation, independently of biliary obstruction.

3. Jaundice is generally *sporadic ;* but, according to Monro, Alibert, and others, it has assumed, on rare occasions, an *epidemic character*, particularly at the terminations of campaigns, and after, or during, very wet summers and autumns. It was thus said to have been epidemic in Cronstadt, in 1784 and 1785 ; and at Geneva, in 1814.—It is *endemic* in some places, particularly those in which, with a high range of temperature, the sources of malaria abound (see Endemic and Epidemic Influences) ; but it is generally owing to the prevalence of biliary diseases and periodic fevers in these localities, that jaundice is also endemic.

4. I. Symptoms.—*A. Precursory.*—Jaundice generally approaches with languor, depression of spirits, slight chills or rigors, anorexia ; with uneasiness, tension, or weight at the præcordia ; with flatulence, sour eructations, sometimes nausea or vomiting, or other disorders of the stomach ; or with colicky pains, disturbed or irregular bowels, and headach. The stools are hard, ash-coloured, clayey, or whitish, indicating an absence of bile ; and sometimes relaxed, although the evacuations are pale or whitish. In rarer cases, the biliary secretion is apparently more than usually profuse. The stools are commonly devoid of their usual odour, and are more or less offensive. There is an unpleasant taste in the mouth, with some thirst. The tongue is loaded at its base. The skin is dry, and an itching or stinging is often felt on the surface. These symptoms are usually of short duration, and the affection manifests itself with much celerity.

5. *B.* The *yellow tinge* generally begins in the eyes, and extends to the temples, brows, and face ; and thence to the neck, chest, and whole surface of the body. The colour is deepest in the wrinkles and folds of the skin, and in the lines of the face and hands. Sometimes it is distributed in deeper patches in one place than in another. It commences in the superior parts of the body, appears latest on the inferior extremities, and departs first from the parts where it commenced. The colour varies from a light yellow or lemon-colour, to a greenish brown ; the intermediate shades of pale yellow, deep yellow, and yellowish green, being most common. With dryness of skin there is generally increased heat, particularly on the hands and feet. The itching and stinging are often also augmented, especially towards the night, and are most troublesome about the nostrils. In the more advanced stages, this symptom is diminished. The perspiration often then becomes free, particularly if the disease be attended by fever ; and in some cases so abundant as to wet the linen, and to tinge it of a deep yellow. Sometimes a desquamation of the cuticle, or a psoriform eruption, follows these symptoms.

6. The bowels are frequently costive, and the fæces clayey, pale, and scanty ; but in some cases they are loose, and have a peculiar fœtor. The urine is commonly high-coloured ; yellowish and limpid at the commencement, afterwards deep saffron-coloured or reddish, frothy, and thick. Sometimes it is nearly black, depositing a brick-coloured sediment ; at other times a dark deposit. As the disease subsides, the urine resumes its clear and limpid appearance, unless dropsy supervene. The patient generally complains of a severe, heavy, or lancinating headach, with a sense of heat, particularly at the forehead ; and he often falls into a state of despondency or melancholy, or becomes morose. There is sometimes lethargy, and frequently watchfulness. The tongue and palate are coated with a yellowish sordes, and a bitter taste is felt in the mouth. The appetite is extremely irregular ; sometimes being entirely lost, at other times ravenous. Thirst is usually present. Pain, weight, or a dragging sensation, and tenderness, are often felt at the epigastrium ; frequently with flatulence, acrid eructations, nausea, difficult or painful digestion, and vomiting of a bitter, acrid, and sometimes dark, fluid. In some cases, acute pain runs in the course of the common duct, and increases as it reaches the epigastrium, with more or less uneasiness in the region of the liver, and top of the right shoulder, or beneath the right scapula, or between the shoulders. Violent pain is occasionally felt in the stomach, with short fits of colic. The respiration is readily accelerated, especially upon exertion ; and there are sometimes paroxysms of cough. The pulse varies exceedingly. At the commencement, it is often hard and strong, but it is also frequently feeble, particularly as the disease advances. When severe paroxysms of pain are complained of, the pulse generally becomes frequent, hard, or full ; but it is occasionally much slower than natural. Hæmorrhoids sometimes occur during

the disease; and they have often, after having discharged freely, proved a salutary crisis. Epistaxis has also been followed by a favourable result; but less frequently than the former evacuation.

7. Some *anomalous* appearances have been remarked during jaundice, which are deserving of notice, from the light they may throw on its pathology. The most important of these are — 1st. The suddenness of the attack — the almost instantaneous occurrence of it after violent affections of the mind. — 2d. Its restriction to particular parts of the body. BEHRENS, VALSALVA, ETTMÜLLER, and others, have observed it confined to the palsied side, in cases of hemiplegia. Dr. CHAPMAN has seen it limited to the face. A similar case has occurred to myself: and instances of its appearance only in the eyes are not uncommon. Allied to these states is the varying deepness of colour in different parts of the body. The deep greenish brown, verging to black, of the skin, commonly called green or black jaundice, described by Dr. Baillie, has been observed in one part of the body, whilst the usual yellow tinge has existed in others. LANZONI met with a case, wherein the throat and face were green, the right side of the body a greenish black, and the left yellow. — 3d. The yellow tinge, which objects occasionally exhibit to the patient during this disease, has been a matter of dispute; but it has been noticed, and believed in, by the majority of ancient authors; and was first disputed by MERCURIALIS, and afterwards by HALLER, HEBERDEN, CHAPMAN, and a few others. I believe it to be of rare occurrence, but to undoubtedly occur, when the cornea, or humours of the eye, participate in the yellow tinge, with the other parts of the body.

8. *C.* DURATION. — Jaundice may disappear, or terminate fatally, in a short time; or it may continue for many months. When it proceeds from moral or mental causes, it is generally of much shorter duration, than when it depends upon visceral disease. In the latter case, it may endure even for years. — But instances sometimes occur of its rapidly fatal termination, when proceeding from acute visceral inflammation, particularly from inflammation of the substance of the liver, and when accompanied by depressed vital power, much fever, and a very frequent pulse. I have seen death occur as early as the fourth day in such circumstances. The darker forms generally proceed more rapidly, especially to an unfavourable issue, than the lighter shades of the complaint. But the duration of it entirely depends upon the constitutional powers of the patient, and the pathological conditions which occasion it.

9. *D.* TERMINATIONS. — Jaundice, like most other diseases, terminates in three ways. — 1st. In a return to health; — 2d. In some other malady; — and 3d. In death. — *a.* Restoration to the healthy state generally takes place without any apparent crisis, although a critical evacuation is sometimes observed. As soon as biliary obstruction is removed, the stools become darker; the urine paler, and the discoloration of the skin begins to disappear, the parts first changed being the first to regain their healthy hue. The *critical evacuations*, are *bilious diarrhœa*, very abundant *perspirations*, *hæmorrhoids*, and *menorrhagia*. In a case which I lately attended, the jaundice rapidly disappeared after the discharge of a blackish inspissated bile, which had evidently accumulated in the hepatic ducts and gall bladder for a long time. The quantity of this pitchy or tar-like matter which was evacuated, was surprising, furnishing a striking instance of the black bile or melaina of the ancients.

10. *b.* In other cases, the disease either acquires increased intensity, or assumes a modified character; — one of the varieties hereafter to be particularized occasionally changes into another. — In some instances, additional disorder is superadded, a severe or dangerous *complication* thus resulting; and in others, the jaundice disappears, but is replaced by another malady. Lethargy, coma, apoplexy, epilepsy, phrenitis, diarrhœa, cutaneous eruptions, inflammation and abscess of the liver, disease of the spleen or of the pancreas, dropsy, rheumatic attacks, &c., may thus supervene — the jaundice still persisting; — and ascites, anasarca, dysenteric attacks, abscess of the liver, and chronic enlargement of the spleen, may follow upon its disappearance. Jaundice is often, also, a symptom of inflammation and abscess of the liver; although these latter are sometimes consequences of the pathological state upon which this affection depends, particularly when they appear subsequently to it. But it is much more frequently a symptom merely; and is oftener consequent on, than antecedent to, or coetaneous with, inflammation or abscess of this organ. Indeed, chronic inflammatory action, or active congestion of the substance of the liver, giving rise to jaundice, is more common, and antiphlogistic means are much more frequently required for the removal of it, than is supposed.

11. *c.* The termination in death may be preceded by the morbid states now enumerated, particularly when they assume their worst forms; — or it may be ushered in by increasing and urgent depression; by sinking of vital power; by great despondency; by ascites or œdema of the lower extremities, or both; or by hydrothorax; by great emaciation, hectic fever, and total loss of the digestive and assimilating functions, and by irritability of the stomach. In some cases, it has given rise to lethargy, coma, apoplexy, palsy, convulsions, or delirium, previously to a fatal issue. — It occasionaly happens, as observed by Drs. CHEYNE and MARSH, that persons labouring under jaundice, whose nervous system has been previously injured, or greatly exhausted, are suddenly seized with cerebral symptoms, and die either phrenitic, or apoplectic, or in convulsions. But death by the sudden occurrence of coma, which becomes more and more profound, is the most common. Delirium also often precedes a fatal termination.

12. *E.* FORMS and STATES. — Jaundice may be considered as *idiopathic*, when it supervenes suddenly upon violent affections of the mind. It is *symptomatic*, — its common form, — when it proceeds from diseases of the liver and biliary apparatus, or from obstruction of the common bile duct, or from lesions of adjoining parts, &c. To these some authors have added a third form, which they have termed *critical*. GRIMAUD states, that it has occurred as a crisis in some fevers: and BIANCHI makes a similar remark, — at the same time stating, that when jaundice is critical, the

urine is almost or altogether natural; whilst in its symptomatic form it is generally of a deep yellow, and otherwise much changed.

13. Jaundice may present various *degrees of severity*. It may be accompanied with great febrile excitement, and thus assume an *acute form*, and quickly arrive at its termination. When this is the case, it is generally accompanied with active hepatic, or other visceral disease, and often passes into a very deep or greenish hue. I was recently called to a gentleman, aged about fifty, of a strumous diathesis, who had begun to ail the previous day. I found him slightly jaundiced, remarkably depressed in spirits, with a sensation of sinking at the epigastrium, the pulse being upwards of 120, and soft. The evacuations were at first clay-coloured and costive, but they soon became copious, black, and tar-like. Delirium appeared on the following day: spontaneous hæmorrhage from the bowels occurred, followed by coma, relaxation of the sphincters, and death on the fourth day. The jaundice progressively increased, and, on the third day, the surface had become a greenish brown. The friends would not allow the body to be inspected.

14. Jaundice may also proceed in an extremely *mild form*, or with but little constitutional disturbance,—the appetite, pulse, and mental powers being scarcely affected; and in this form it may continue long, or soon disappear, sometimes after very inefficient means of cure, or even without the use of any medicine. The liability of the disease to recur from slight causes — as errors of diet, intemperance, &c. — has sometimes given it an apparently *periodical* character, which, although contended for by some authors, is entirely accidental, or, at least, the consequence of a concurrence of several of its causes, at certain seasons or periods, especially in situations abounding in the sources of endemic maladies.

15. II. CAUSES.—i. The *Predisposing Causes* are indolence, dissipation, intemperance, and sedentary occupations, particularly those performed in a stooping posture, and with pressure on the hypochondria and epigastrium. Jaundice is not infrequent among the studious; and especially amongst those who are harassed by cares, disappointments, and the depressing passions, and whose nervous energies are exhausted. It seems also more frequent in hypochondriacal and hysterical persons, and those who neglect, or are deprived of, their usual active engagements. It is common to all ages and sexes. HEBERDEN found, that out of 100 successive patients with this disease, 52 were males. It is frequently met with in cooks, and bakers, and in workmen exposed to high ranges of temperature, or addicted to intoxicating liquors. In females, it is oftener observed during pregnancy, and after the cessation of the catamenia, than at other epochs.

16. ii. The most common *Exciting Causes* are the more violent mental emotions, as the sudden communication of distressing intelligence, fright, terror, rage, anger, grief, anxiety, despondency, losses and disappointments, jealousy, petulance, peevishness, and irritability of temper. I have known it to follow the communication of joyful intelligence. Particular kinds of ingesta, especially such as disagree with the digestive organs, as stale, unseasonable, and unwholesome fish; drinking cold fluids when the body is perspiring; cold applied to the feet and surface of the body after exertion, or during free perspiration; and the bites of animals, particularly those which are venomous; also occasionally produce jaundice, especially in those who have experienced a former attack. According to HOFFMAN, venereal excesses, and intemperance in the use of intoxicating liquors, are amongst the chief causes of the disease. Great debility and exhaustion of the nervous energies, and, as clearly demonstrated by Dr. CHEYNE and Dr. MARSH, mercurial courses, particularly when employed in hospitals and close apartments, sometimes occasion it. I believe, however, that mercurials are a cause, only when they are given to produce their specific effects, or, when the exhibition of purgatives has been neglected, when required. The prevalence of the disease during revolutions, invasions, sieges, and campaigns, has been remarked by many writers; and its occurrence after intemperance in eating or drinking must be familiar to all. The excessive use of coffee; austere, and acid, or unripe fruits; and, indeed, any error of diet, or deleterious substance received into the stomach; will sometimes produce it. The suppression of accustomed discharges and eruptions, and the retrocession of rheumatism and gout, also not infrequently occasion it.

17. When the pathological conditions of the biliary and digestive organs exist, with which this disease is most frequently connected, many causes, that under different circumstances would produce but little effect upon the system, will readily excite it. Severe pain, mental affections, an irritating purgative, or particular kinds of food, will sometimes be sufficient to give rise to an attack, especially when pre-existing disorders of the biliary organs is associated with great nervous exhaustion. Jaundice is not infrequently caused by obstructed circulation through the heart; and by a torpid state of the cæcum and colon, with accumulations of fæces and scybala in their cells. It often follows agues and other periodic fevers; and it then usually depends upon some one of the morbid states of the liver, already noticed. It often occurs in the course of bilious remittent fevers, and occasionally without any apparent diminution of the biliary discharge, and even with evidence of augmented secretion of bile. It is also often associated with dysentery, or with other diseases, as will be shown in the sequel.

18. III. The MORBID APPEARANCES most frequently found in persons who have died *with* jaundice, are the following: — *a*. The *surface of the body* generally preserves the same colour after death, as previously to dissolution. PORTAL and myself, however, have seen the intensity of colour diminished; and, in other instances, the skin of some subjects, who had never had jaundice, assume, after death, a deep yellow. The limbs are often flexible, and œdema of the extremities is not infrequent. The body is commonly emaciated. The serum in the œdematous limbs, as well as that in the internal cavities, is either of yellowish tint, or of a dark hue. The various structures are more or less tinged of the same hue, particularly the cellular, adipose, and serous tissues. The internal surface of the blood-vessels, and even the cartilages, tendons, periosteum, and bones, are sometimes also changed in colour. The muscles are often tinged, and softer and more flaccid than natural. MORGAGNI had re-

marked, that the substance of the lungs, heart, liver, kidneys, and spleen is often softened, and contains a yellowish, a greenish yellow, or reddish fluid; and subsequent observers have also noticed these appearances. Most of the *secretions* partake of the same tinge; and the serum of the blood is also similarly altered. The fluid effused into the ventricles of the brain and all the membranes, are thus changed; but the substance of the brain itself, and the humours of the eye, are generally of their natural colour.

19. *b.* The *liver* and its appendages, most frequently of all the viscera, present morbid changes. The liver itself has been found with all the lesions consequent upon every form of inflammation. It is sometimes greatly enlarged, its blood-vessels congested, its ducts engorged, and its structure softened, inflamed, deeply tinged, or suffused with bile, and containing one or more abscesses, or their remains, &c. At other times it is extremely pale, apparently devoid of blood and of biliary secretion, atrophied, hardened, scirrhous, and tuberculated. In one case it is changed to a white, parboiled state; in another converted into a fatty, steatomatous, tallowy, or adipocerous substance. Occasionally its ducts are loaded with green inspissated bile, obstructed by concretions of cholesterine or of resinous matter. In other instances they are entirely empty, or contain merely a little thin, pale fluid. Sometimes the surfaces of the liver adhere to the adjoining viscera, and collections of matter or large abscesses press upon them, or upon the bile ducts, or open into the latter, or into other parts. In a few instances the *hepatic veins* have been found more or less obstructed, or pressed upon by tumours or enlargements of adjoining parts. In one instance of jaundice connected with abscess of the liver, I detected inflammation of these veins, several of them being plugged up with lymph, or filled with pus. In rarer instances, hydatids are found in the liver, or attached to it. (See art. Liver.)

20. *c.* The *gall bladder* often contains *calculi*, the number and size of which are very various. When one only is found, it is usually very large. The gall bladder may be distended with *bile:* in this case the fluid is much changed; being generally of a deep green colour, or greenish black, thick and ropy, and sometimes containing granular matter. In some instances, the accumulated fluid is of a pale orange colour, and thin consistence. A portion of fluid of this description, which was taken from a subject dead of tuberculated liver, jaundice, and dropsy, was examined by Dr. Bostock, and found to consist of water, albumen, and a little colouring matter, without any of the usual biliary principles. Stoll found the gall bladder filled with a whitish serum. In other cases it is entirely or nearly empty. Sometimes marks of inflammation are observed in its coats. The last named author found them changed to a semicartilaginous state. Frank, Louis, and Andral met with ulceration of the internal surface, with softening of the coats of the gall bladder; and a similar case occurred to myself, where it contained gall-stones. Andral found it softened and ruptured. Excrescences into its cavity have been noticed by Bonet. Adhesions of it to the adjoining parts are occasionally observed. Its entire absence in this disease occurred to M. Bourgeoise; but this is merely a coincidence. In a case of absence of gall bladder in a patient at the Infirmary for Children, there was no jaundice; and similar facts have been observed by others.

21. *d.* The *biliary ducts* are frequently obstructed, in some cases by gall-stones, in others by the pressure of tumours in the pancreas, mesentery, pylorus, or duodenum. The common duct is not infrequently obstructed by scirrhous or other tumours in these situations. In this case, as well as when it contains calculi, the gall bladder, and the duct above the seat of obstruction, are generally greatly dilated, and filled with thick, dark-coloured bile. This dilatation sometimes extends more or less throughout the ramifications of the hepatic ducts. In a case which occurred in my practice some years ago, and where both the common and the pancreatic ducts were completely obliterated by their inclusion in a large, hard, or scirrhous tumour, developed between the root of the mesentery, and head of the pancreas, — this latter being remarkably enlarged, — the gall bladder contained about twelve ounces of this kind of bile, and the ramifications of the ducts through the liver were much dilated. The coats of the ducts sometimes exhibit marks of inflammation, — are ulcerated, thickened and indurated, and the calibre of their canals are much reduced. In some instances, the ducts are entirely obliterated, and reduced to a thin fibro-cellular cord. This obliteration I have seen confined in one case to the common duct, in another to the cystic duct. In the latter instance, the gall bladder was enormously distended with a deep green viscid bile: the obliteration of the duct must have been subsequent to the accumulation of the secretion in this reservoir. Stoll, Portal, Andral, and others observed a cartilaginous state of both the common and cystic ducts. Lieutaud, Ludwig, and Chapman found lumbrici in the common duct, in icteric patients.

22. *e.* The *stomach* is not infrequently seriously altered, particularly when the disease has been occasioned by intemperance, especially in the use of spirits. The pylorus in those cases is sometimes thickened, cartilaginous and greatly constricted (Stoll). — The *duodenum* is often, also, the seat of lesion, especially in the vicinity of the ducts. It is sometimes inflamed, thickened, softened, or indurated, ulcerated, and, in rare cases, apparently scirrhous. Tumors of various kinds have involved its coats, at the place where the ducts enter it, either entirely obliterating their apertures, or very greatly diminishing them. Oechy found this viscus remarkably dilated, so as to press upon the ducts. The *pancreas* is occasionally enlarged, scirrhous, or otherwise altered,— pressing upon, or obstructing, the ducts. Great enlargement of the *right kidney* has also produced this effect. The *spleen* is sometimes enlarged, or otherwise altered.

23. *f.* Alterations of the *vena portæ* are also met with in jaundice. M. Honoré found this vessel nearly impervious. It has been observed considerably enlarged throughout its ramifications, and congested with black blood. In a great number of icteric cases, the viscera adjoining the gall bladder are much stained by the exudation of bile through its coats. But this is an entirely *post mortem* appearance. — *Dropsical effusions* into the

various cavities are frequently met with, and occasionally coincident lesions in the *heart, lungs*, as well as in some one or more of the abdominal viscera.

24. It should not be overlooked, that each, or several, of the foregoing lesions have often been present without jaundice,— a circumstance which has led some pathologists to deny the origin of it in the presence of bile in the circulation; and that jaundice has existed in patients, in whom no organic lesion was detected after death,— an occurrence which has led physicians, since the times of HOFFMANN and MORGAGNI, to impute the disease, in some cases, to spasm of the biliary ducts, and induced others to view it as an occasional consequence of the accumulation in the blood of the materials of which bile is formed, owing to inaction of the liver. But there is every reason to suppose that undetected disease of the heart had existed in many of these, and had obstructed the return of blood from the liver.

25. In cases of jaundice, particularly in those of long standing, a yellow or greenish yellow tint, in different degrees, is usually observed in every texture and organ of the body, and in all the fluids and secretions, whether natural or morbid. The fat is usually of the deepest colour. The humours of the eye and the cornea are seldom or ever tinged. A case is, however, related in HORN's *Archives* (*Für Pract. Medicin.* b. vi. p. 341.), where they exhibited this change of colour. The yellow hue has rarely been detected either in the cerebral structure, or in the medullary tissue of the nerves; although instances have occurred to BARTHOLIN, MORGAGNI, and PORTAL, of its appearance in the former.

26. IV. OF THE PATHOLOGICAL RELATIONS OF JAUNDICE.—Jaundice is more or less intimately connected with one or other of the following pathological conditions: — 1. With an exuberant secretion of bile; — 2. With inflammation and abscess of the liver; — 3. With congestion of the liver and portal system; — 4. With chronic alterations of the structure of the liver; — 5. With spasm, or temporary obstruction of the gall ducts; — 6. With the passage or existence of gall-stones; — 7. With inflammation, obliteration, or compression of the biliary ducts, or gall bladder; — 8. With inflammation of the duodenum.

27. i. *Jaundice with Exuberance of Bile.*—This variety was first contended for by M. PORTAL, and afterwards by MM. CORNAC, ALIBERT, VILLENEUVE, and others. It has been referred to an excited state of the vital actions of the liver, particularly to the predominance of its secreting function. It is sometimes met with in temperate climates, during summer and autumn, especially those which apppoach nearest the tropics; but it occurs chiefly in warm or intertropical countries, and in those who live indolently and luxuriously or intemperately, or who are of a bilious temperament. It is generally preceded by supraorbitar headach, bitter taste in the mouth, loss of appetite, nausea, bilious vomiting, followed by a yellowish, or greenish yellow tint of the skin. The chief characteristic of this form of the disease is the absence of constipation, and the presence of bile in the evacuations, which are either natural, or more frequent than usual. I have seen it accompanied with slight bilious diarrhœa, with febrile action, or with a full or strong pulse. It may be presumed, that a portion of the bile is absorbed in this variety, during its course through the biliary passages, or through the intestinal canal, owing either to increased activity of the absorbing vessels, to the state of the bile itself, or to partial obstructions in its course through either of these parts. It is often complicated with dysentery, hepatitis, and bilious fevers, particularly in miasmatous and intertropical countries.

28. ii. *With Inflammation and Abscess of the Liver — Hepatic Jaundice*, SAUVAGES and CULLEN —*Icteritia Pyrexica*, ALIBERT.—Jaundice may accompany any form of inflammation in this organ, particularly when the internal structure is the seat of the morbid action. Although inflammations of the liver are so extremely frequent in India, yet jaundice is a comparatively rarer attendant on them there, than in this country. In Continental countries, this association of jaundice is very common. The rare occurrence of jaundice, as a symptom of hepatitis, in India, is perhaps owing to the liberal use of calomel in the treatment of hepatic affections. But it is when abscess forms in the liver, that we most frequently find jaundice supervene on hepatitis. In a very large proportion of the cases of abscess of this viscus, detailed by M. ANDRAL (*Clinique Médicale*, t. iv.), jaundice appeared;—and a similar frequency of connection has occurred in my own practice. Out of six cases of abscess of the liver to which I was called, in 1826 and 1827, in consultation, four had jaundice during some period of their progress, subsequently to the occurrence of the symptoms indicating the formation of matter.

29. In almost every case of jaundice from inflammation or abscess of the liver, the nature of the disease is very readily recognised. The symptoms of hepatitis are well marked, particularly the pain, uneasiness, and tumefaction in the right hypochondrium and epigastrium; the scanty, dark, or brownish urine; the dry cough; the pain in the right shoulder, clavicle, and side of the neck, or under the right scapula, &c.; and the full and frequent pulse, &c. (See LIVER —*Inflammation of*, and *Abscess of*.)

30. iii. *Jaundice from Congestion of the Liver — Intemperies calida, of* SENNERT — *Icterus a Plethora*, of F. HOFFMANN. — The connection of this state with jaundice has been admitted by SAUVAGES, GRIMAUD, BANG, PORTAL, CORNAC, and MANOURY. It is generally observed in persons of the bilious and sanguine temperaments, who live luxuriously or intemperately, and either pursue sedentary occupation, or are deprived of requisite exercise. It is chiefly to this and the preceding pathological states, that we are to refer the instances of jaundice, which take place from the suppression of the menses, or of accustomed discharges, particularly the hæmorrhoidal, and from the retrocession of gout and rheumatism. Active congestion of the portal vessels is connected with more or less plethora, and congestion, of all the vessels that convey blood into the vena portæ. The blood circulates with difficulty through the liver; and the bile, which is formed, generally in great abundance, owing to the highly venous state of the blood, often is retarded and accumulated in the ducts, during its course to the gall bladder or duodenum. Owing to this retardation or obstruction, a portion of it is absorbed, probably by the radicles of the hepatic veins, as they pass out of

the granular structure, where the biliary secretion is performed, and the ducts take their origin. It is obvious, that obstructions of the return of blood from the liver, owing to *organic lesion of the heart*, will also give rise to this form of the complaint, and that such occurrences are not rare.

31. iv. *With Chronic Organic Alterations of the Liver* — *Aurigo ab Obstructione*, **Sauvages**—*Icteritia Apyrectica*, **Alibert**. — In this form of the disease, the accession of the jaundice is generally very slow; the colour is livid or dusky, permanent, and often extremely deep, approaching sometimes a greenish or olive hue, forming the green or black jaundice of several authors. The organic alterations vary remarkably; consist of those already enumerated (§ 18. *et seq.*); and are often complicated with lesions of the adjoining viscera, or with dropsical effusions. In the majority of these cases, the bile seems either to be secreted with morbid properties, and to be conveyed into the circulation almost as soon as it is secreted; or, what appears still more probable from the morbid appearances very frequently detected, the materials of which bile is formed, are not combined by the liver, and converted into bile, but, having experienced the preparatory change, merely pass onwards from the granular structure of the liver into the radicles of the hepatic veins, and, circulating with the blood, tinge the textures of the body, particularly the rete mucosum. That there is sometimes no due secretion of bile, is shown by the secreting structure of the liver being often found either completely destroyed, or so altered, as not to admit of the demonstration of its peculiar texture; and also by the pale, straw-coloured, tasteless, and albuminous serum found in the ducts (§ 19.); or by their empty, atrophied, and pale states. This variety of jaundice is generally the consequence of intemperance, or of residence in miasmatous districts, or in warm climates. It is often observed in persons of middle age, or somewhat further advanced in life; and is preceded by chronic dyspeptic or bowel complaints; and by indications of disorder in the liver, often of many years' duration.

32. v. *Jaundice from suspended Function of the Liver, or from Spasm of the Ducts* —*Icterus a Spasmo*, **Hoffmann**.—That jaundice ever proceeds from spasm of the gall ducts, has been denied by several writers. **Cullen**, **Powell**, **Andral**, and **Jourdan** have, however, contended, that spasm of the ducts sometimes occurs, and produces the disease, especially in cases arising from mental emotions, and the irritation of the upper portion of the intestinal canal. Sudden mental affections, — as fright, terror, rage, anger, disappointment, excessive joy, — frequently occasion a most painful and oppressive sensation at the epigastrium, faintness or difficulty of respiration, and paleness of the countenance. This state is occasionally followed almost instantly, but always in a very short time, by yellowness of the face and surface of the body. In some cases, the functions of the brain are much disturbed, and a febrile state of the system takes place. In others, nausea, vomiting, &c., in addition to the icteric affection, are produced. In these, the moral affection influences the state of the nerves proceeding from the solar plexus; and hence the morbid sensations referred to the epigastrium. The slow depressing passions of the mind were also supposed, particularly by **Villeneuve** and **Manoury**, to occasion spasm of the ducts; and physical pain was considered by M. **Portal** occasionally to operate in a similar manner. When jaundice is connected with hysteria, epilepsy, or hysteralgia, **Hoffmann** referred it to the same cause. Even the bites of venomous reptiles were supposed by **Mead** and **Bosquillon** to produce icterus in a similar way. **Bartholin**, **Lanzoni**, and **Van Swieten** have imputed the rare occurrence of jaundice from the bites of dogs, or other animals, also to this circumstance.

33. Cases of this kind admit of a different explanation from that proposed by the above writers. It is more probable that violent mental emotions, and that sedative poisons taken into the stomach, or inserted into the tissues, suspend the organic nervous influence, and thereby arrest the functions of the liver, than that they occasion spasm of the ducts and adjoining parts. That this latter state, however, may occur, I will not deny, especially when nausea, retchings, or vomiting are added to the icteric affection, or when the duodenum is irritated in the vicinity of the ducts. The more or less complete paralysis of the biliary organs, produced, for a time, by the causes alluded to above, favours the absorption or passage of bile into the circulation, and the accumulation in the blood of the elements of which bile is formed.

34. The principal characteristics of this variety of jaundice are its rapid appearance and short duration. It is seldom deep, and generally is of a pale yellow, or bright yellow hue. It often disappears without the aid of medicine; and the treatment resorted to, in such cases, thus obtains a reputation it does not deserve.

35. vi. *With Inflammation and Obliteration of the Ducts and Gall Bladder.* — The ducts may be inflamed, and obstructed in consequence of the turgescence accompanying the inflammation, or as MM. **Jourdan** and **Breschet** have stated, of some degree of spasm attendant on it. The inflammatory action may also extend to the gall bladder, or be almost entirely limited to it. Inflammation and its consequences have been observed after death in one or other of these situations, both in connection with, and independently of, jaundice; and have most probably been induced by the irritating properties of the bile passing through the ducts, or by the extension of inflammatory action from the internal surface of the duodenum to that of the common duct. In either circumstance, the ducts above the obstruction may become dilated, although not to the extent observed after obstructions of a more permanent kind. If, however, the consequences of inflammation furnish a permanent obstruction, this result will often occur.

36. In cases of this kind, the patient has more or less fever, dry skin, thirst, and anorexia or nausea, or even retchings. Pain is felt in the right hypochondrium, particularly under the exterior and inferior angle of the right shoulder blade, extending to the epigastrium, on the right side of which, or beneath the extremities of the right false ribs, a pyriform moveable tumor is sometimes felt. The stools are without bile. More or less fulness of the right hypochondrium and epigastrium is also often present, sometimes with pain not only in the above situations, but also in the back, and in distant parts. These

symptoms may continue an indefinite period with various degrees of severity; and may subside with the jaundice after a time, upon the resolution of the inflammation.

37. In less favourable cases, owing to the thickening consequent upon the inflammation, or to the exhalation of coagulable lymph from the internal surface of the inflamed duct, together, perhaps, with spasm, its canal becomes permanently obstructed, and the vessel is ultimately reduced to a fibro-cellular cord. In these, the jaundice generally continues, and all the digestive and assimilating functions languish; death ultimately taking place.

38. vii. *Jaundice from Compression of the Ducts by Tumors, &c.* — The lesions of the adjoining viscera already referred to (§ 21.), particularly the formation of scirrhous and other tumors in the pancreas, pylorus, mesentery, &c. involving and obliterating the ducts; enlargement, and disease of lymphatic glands in the vicinity of the common duct; engorgement or inflammation of the pancreas, occasioning compression of this duct; great enlargement of the right kidney; distension of, or accumulations of hardened fæces in, the cæcum and colon; the gravid uterus, &c.; may occasionally interrupt the passage of bile into the duodenum, by pressing upon the ducts, and thus occasion jaundice. It is only by pressing scybala, or hardened fæces lodged in the cells of the colon, upon the duodenum and common duct, that the gravid uterus causes jaundice. It is extremely difficult to ascertain the presence of any of those causes during the life of the patient; although suspicions of the existence of some of them may be entertained from the *tout ensemble* of the symptoms, and the effects of remedies. When jaundice arises from accumulated fæces, the effects of purgatives will often demonstrate its origin. The frequency of this cause has been justly insisted on by Van Swieten and others.

39. viii. *Jaundice from Calculi in the Ducts — Aurigo Calculosa*, Sauvages. — Calculi lodged in the ramifications of the hepatic duct, may occasion, or rather be connected with, jaundice; but their presence in the common and cystic ducts is a more frequent cause. They are more rarely found in the hepatic duct, but they may produce the disease in that situation. Their impaction in the cystic duct, even when the gall-bladder is filled with dark bile, does not uniformly occasion this affection, as shown by numerous observers. When they obstruct the common duct for some time, this effect very generally, although not always, follows; and the symptoms, particularly when the calculus approaches to, or is passing through, the coats of the duodenum, are often very well marked. In many cases, however, calculi pass without giving rise to jaundice, or, indeed, to any very prominent symptom or ailment; and in others, they pass with violent sufferings, and yet no jaundice is occasioned.

40. More commonly the occurrence of jaundice from the impaction of calculi in the bile ducts, particularly the common duct, is attended with pain, weight, pressure, and uneasiness towards the epigastrium, especially when the patient lies on the left side. Acute, colicky, and spasmodic pains are felt at intervals in the region of the duodenum, under the right shoulder blade, and extending to the hypochondrium and epigastrium, followed sometimes with nausea, vomiting, and a sense of heat at the stomach. Occasionally, a tumor is detected between the epigastrium, hypochondrium, and umbilicus. When the fits of pain are violent, the patient often complains of vertigo, of the extension of the spasm to the abdominal muscles, and even to the extremities. There is seldom only one calculus, generally several; and the attack is often renewed upon the passage of each, with a varying degree of severity according to their size. The jaundice in these cases may precede, or even follow, the painful symptoms. Upon the discharge of the calculi, these symptoms quickly subside; but the jaundice disappears only slowly, or even persists for some time.

41. The production of jaundice by the presence of *worms in the ducts* has been stated by several authors, and doubted by others. Dr. Chapman refers to a preparation demonstrating the fact in the museum of the University of Pennsylvania.

42. ix. *Jaundice from Inflammation or Congestion, &c. of the Internal Surface of the Duodenum.* — Various deleterious ingesta, acrid salts and poisons, emetics, and purgatives, articles of food which offend the stomach, drinking cold fluids, &c. when the body is overheated, or exposure to cold, have been supposed by Broussais and his followers sometimes to occasion so much inflammation and turgidity of the mucous membrane of the duodenum and adjoining parts, particularly about the orifice of the ducts, as as entirely to occlude it, and thereby to give rise to jaundice. That this takes place in rare cases, or that congestion in this situation will have the same effect, may be admitted, although satisfactory proofs of the circumstance cannot be readily furnished. The inflamed and turgid state of the duodenum may be limited to it, or may even extend to the ducts, as stated above, and thus cause obstruction (§ 35.). The jaundice accompanying bilious fevers and dysentery may depend upon this pathological state.

43. It is probable that this variety of jaundice will be attended by very nearly the same symptoms, as characterise that proceeding from inflammation of the ducts; but that, unless the ducts become implicated, the jaundice will be less marked, and of shorter duration, than when they are inflamed. The presence of nausea, vomiting, or of diarrhœa, or of sympathetic phenomena, in such cases, furnishes but slight evidence of this pathological state. Oechy states that he has seen the duodenum dilated so as to press upon and obstruct the ducts, in a case of jaundice; but there was probably some other lesion upon which the jaundice more immediately depended than upon this.

44. Various other morbid states of the duodenum may occasion jaundice, particularly the accumulation of mucus on its surface, or about the orifice of the ducts; and various organic lesions seated in this part, or extending to it, or to the ducts from adjoining viscera. The former of these is probably not an infrequent cause of the slighter and less enduring kinds of jaundice, particularly in infants (§ 53.), children, and young persons.

45. V. Jaundice from Suspension or Arrest of the Secreting Function of the Liver — *Pseudo Jaundice.* — In this form of dis-

ease, which cannot be considered as a variety of true jaundice, bile is not secreted or formed from its elements in the blood, owing either to a paralysed or suspended state of the vital action of the liver, or to disorganisation of it to an extent entirely subversive of its functions. In either case, the elements, from which the bile is formed, accumulate in the circulation, change the colour of the serum and of the blood generally, and thus render the skin lurid or murky. In a further advanced stage of the disorder, certain of the principles, or even the colouring matter, of bile are fixed, or deposited, in the tissues, imparting to them either a darker, or a more jaundiced hue. (See art. DISEASE, § 108.) The slighter states of this form of disorder frequently accompany torpor of the liver, as observed in this country; and the more marked states of it often occur in miasmatous and warm climates. In various fevers also, and in some epidemics and pestilences, the action of the liver is entirely suspended; the surface becoming dark or lurid. This takes place to a remarkable extent in *pestilential cholera*, and is heightened by other circumstances.—When this state of disease arises from disorganisation of the liver, its accession is slow, and the discoloration of the surface often proceeds through a dirty or lurid hue to the greenish or greenish black colour about to be noticed. In either of the pathological states producing the discoloration, there is an entire absence of bile from the stools; and the secretions from the kidneys and skin are dark, or otherwise altered, from the presence of the elements or of the principles of bile.—When the vital power of the organ is suspended, there is seldom pain or other prominent symptom detected in the region of the liver. There is even sometimes an unusual absence of symptoms indicative of acute hepatic disease, excepting the complete suspension of the functions of the organ. But when the structure of the viscus is so altered, as to be incapable of discharging its offices, the antecedent disorder, as well as the attendant phenomena, will generally indicate the pathological relations of the affection, aided by the history of the case, and a knowledge of the causes. The alterations of the liver, already noticed in connection with true jaundice (§ 19.), will occasionally, when carried to the highest pitch, give rise to this form of the disease, or to the next to be noticed (§ 46.).

46. VI. OF GREEN OR BLACK JAUNDICE — Μελαίνα νοῦσος, Grec. — *Icteritia nigra*, FORESTUS — *Icterus viridis, Melas Icterus, Melanchorus*, FENNEL, et Var. Auct. — *Icterus Melæna*, GOOD — *Green Jaundice*, BAILLIE — *Black Jaundice.* — This is merely the extreme grade of the disease. It was first described by ARETÆUS; but although somewhat circumstantially noticed by several authors, the first satisfactory account of it was furnished by Dr. MARCARD and Dr. BAILLIE. The colour of the skin varies in depth from a yellowish green, to a deep green or olive colour. The temperature of the surface is not increased; but burning heat is felt in the palms of the hands, and soles of the feet. The evacuations are often pale; but sometimes they are dark coloured, pitchy, with grumous coffee or chocolate like matter, and slight diarrhœa. The urine is occasionally clear, but oftener very dark and loaded, tinging the linen of a dark, tawny hue. The patient is greatly depressed, physically and morally, and complains of anxiety at the epigastrium, and of tenderness either in that situation, or in one or both hypochondria. A sensible enlargement of the liver is often felt, and sometimes also of the spleen. In a case which I lately treated, both these viscera were very remarkably enlarged. But an opposite state as frequently obtains. The pulse is usually natural or slow. Vertigo, sickness, and vomiting of a green, acid colluvies, occasionally are present. In the intervals, the appetite is either capricious, or but little affected.

47. This form of jaundice seldom attacks young persons. It is commonly met with in the aged or advanced in life, and is much more frequent in males than females, particularly in those who have lived long in unhealthy intertropical countries, or who, with great anxiety and fatigue, have been tried by frequent changes of climate. It is generally connected with the most chronic and profound organic lesions of the liver, especially those which involve, or destroy, its secreting structure, and obliterate the minuter ramifications of the ducts through the organ. It seldom admits of more than a partial removal, but terminates in either a fatal exhaustion, or with coma, apoplexy, epilepsy, or palsy. Abdominal dropsy frequently takes place in its progress. Its course, in its slighter grades, is generally slow,—sometimes continuing, with various fluctuations, for seven or eight years; but when the colour becomes very deep, it often terminates rapidly, in either of the above ways.

48. When green jaundice is attended with pitchy, or dark, grumous evacuations, there is generally either a congestion of the spleen, and of the portal system of vessels, with the secretion of a dark-green unhealthy bile, a portion of which is absorbed, and deposited in the structures, particularly in the *rete mucosum;* or a congested and hæmorrhagic state of the mucous membrane of the stomach, duodenum, and upper part of the intestines, owing to the obstructed circulation through the liver; but both pathological conditions may be present, giving rise to an exhalation of venous blood from this membrane, and thereby to the dark and grumous motions. The mucous membrane in these situations is usually found, on dissection, dark-coloured, mottled, softened, ecchymosed, or its venous capillaries loaded. The other viscera, particularly the *liver* and *ducts*, present the appearances already described (§19, 20.).

49. VII. COMPLICATED JAUNDICE. — By this appellation, I mean the occurrence of jaundice — 1. during the course of some other disease; and, 2. upon the subsidence or suppression of a pre-existing disorder, which may not only be concerned in its appearance, but also in its removal or recurrence. — *A. The maladies during the progress of which jaundice most commonly occurs*, are chiefly those fevers which implicate, in a more or less marked manner, the liver and digestive mucous surface. Thus it is frequently observed in the course of *gastric*, and of *bilious remittent fevers*, of both an inflammatory or low character. It is also not infrequent in connection with *ague;* and, owing partly to this circumstance, it has been said by some authors to recur *periodically*. Its appearance in the course of *typhus fevers* is

comparatively rare. **Mende** has sometimes remarked it; and **Cheyne** notices its infrequency. When it occurs during *fevers*, it may be imputed either to diminished excreting activity of the liver, and the rapidity of absorption of a portion of the secretion, or to obstruction in the way of the opening of the ducts into the duodenum, from a tumefied, congested, or inflamed state of its mucous surface. In some cases, both states may contribute; whilst in others, the secretion takes place more rapidly than it is conveyed into the bowel, although its flow is in no respects impeded. The secreting function of the organ may also be much diminished, — the constituents of bile being left in the blood.

50. We occasionally also observe jaundice in connection with *organic lesions of the heart, hysteria, dropsy, melaina, delirium tremens, apoplexy, palsy*, and *epilepsy*. —When it is complicated with *hysteria*, the urine is usually very abundant and limpid, and the complication is of a much less serious nature, than with the other maladies just named, which more frequently terminate unfavourably, when thus associated. — When it occurs in consequence of interrupted circulation through the heart, dropsy, or hæmorrhage, often also supervenes. We also not infrequently hear of it in connection with certain *cachectic* and *malignant affections* of a chronic character. Several of the states, which are usually attributed to jaundice, in the last stages of these maladies, are not true jaundice, and do not proceed from the presence of bile, or of its constituents, in the circulation; but from the absorption, and admixture with the blood, of a portion of the morbid matters formed in the seat of the local or malignant affection, or of some of the morbid secretions retained in the digestive canal (§ 54.).

51. *B.* Jaundice sometimes follows the subsidence or suppression of other diseases, and is even removed by the reproduction of certain of them: it often appears after periodic fevers, and occasionally upon the sudden arrest of these fevers by large doses of cinchona or of sulphate of quinine, especially when these are exhibited before morbid secretions or accumulations have been evacuated. In such cases, the jaundice depends chiefly upon superinduced congestion or inflammation of the internal structure of the liver. The stoppage, also, of *hæmorrhoids*, sometimes gives rise to jaundice, by inducing these morbid conditions of this organ; the re-establishment of the hæmorrhoidal flux generally removing the congestion, and favouring resolution of the inflammatory action. A similar result occasionally occurs from obstruction of the catamenia, and from suppression of dysentery, diarrhœa, of gout, and of rheumatism, especially when morbid secretions, and collections in the digestive canal, have not been removed. The relation of gout to several of the pathological states which give rise to jaundice, and the conversion, in some instances, of the one into the other, have been remarked by several experienced physicians; and a similar connection has been noticed between this latter and the other diseases just named.

52. VIII. **Traumatic Jaundice.** — Jaundice sometimes occurs after concussion of the brain, and severe injuries of the head. The influence which the brain exercises on the functions of the liver, has been oftener the subject of remark than of explanation. It has usually been imputed to sympathy; or, in other words, the morbid relation has been stated, and our ignorance of its nature admitted at the same time. Severe injuries, when they suspend the energies of the brain, may also lower the secreting and excreting functions of the biliary apparatus, by diminishing its nervous energy, and placing it in a state which (§ 33.) favours the absorption of bile into the circulation, independently of any very obvious change in the structure of the liver or ducts. There is, however, every reason to suppose that jaundice subsequent to severe injuries, particularly of the head, sometimes results from phlebitis, originating in the seat of injury, or from the passage of purulent or other morbid secretions thence into the circulation. In either case, purulent collections will sometimes form in the liver, and give rise to jaundice by pressing upon the hepatic ducts and veins. Severe injuries in other situations than the head, — as compound fractures, &c., — will sometimes also produce the same results. That purulent collections form in this viscus, under these circumstances, almost as frequently as in the lungs, is a fact fully established by the observation of the author, and other pathologists; and although jaundice is not a constant, yet it is a very general, attendant upon them. — Injuries, wounds, &c., which implicate any part of the biliary apparatus, occasionally produce jaundice, by the immediate change they induce in the functions or structure of it; and it is not unlikely that, in some of the instances where the injury seemed to have been inflicted on the head, the liver actually had sustained the chief injury, or had experienced a concussion, of which jaundice was the consequence, either with, or without, inflammatory action diffused through the substance of the organ. —When jaundice follows blows or injuries on the region or vicinity of the liver, and especially if it be attended by a dull or aching pain, inflammation extending through the substance of the organ may be inferred to exist.

53. IX. **Infantile Jaundice** —*Icterus Infantum* —*Icterus Neonatorum* —*Yellow Gum*.—Jaundice is usually slight during the infantile age. It is generally attended with languor, drowsiness, or debility; and may be referred to the following pathological states: — 1st. To the stagnant and altered blood contained in the umbilical vein, changing the state or colour of the serum; — 2d. To a partial absorption, from retention of the meconium; — 3d. To saburræ accumulated in, and absorbed partially from, the duodenum and small intestines; — 4th. To obstruction of the aperture of the ducts from viscid meconium, and mucous sordes; — 5th. To spasm of the excretory biliary ducts (**Beaumes**); — 6th. To a superabundance of the biliary secretion: — and, 7th, To obstruction, or a paralysed state of the secreting structure of the liver. The first, second, and third of the above sources may so change, or deepen the colour of, the serum of the blood, independently of any absorption of bile, as to give rise to the yellow state of the cutaneous surface frequently met with in infants. — Superabundance of the biliary secretion may exist in more than one respect; — this fluid may be secreted in unusually large quantity, or it may have accumulated in the ducts and gall bladder during the period immediately antecedent to birth, or it may have flowed into the duodenum in very large quantity, and

mixed with the secretions of the digestive mucous surface, forming a meconium, abounding more than usual in biliary principles, instead of the bland albuminous fluid, which is usually formed for the purpose of assisting fœtal nutrition and growth. — A paralysed state of the secreting structure of the viscus has been ascribed by M. BEAUMES to injury sustained by the brain during child-birth, but it may exist independently of this cause. One or more of the above pathological states may give rise to jaundice in infants, which is generally mild, and readily removed by medicine. It usually occurs very soon, or within the first week, after birth, particularly when the bowels have been neglected; but it may appear at any period. When it comes on within the first week after birth, it seldom continues above four or five days, and is usually slight.

54. X. OF CACHECTIC OR SPURIOUS JAUNDICE. — Morbid secretions readily pass into the circulation in the course of various malignant, pestilential, and cachectic maladies, and impart a dark or dirty hue to the serum, and otherwise affect the blood, producing a similar tinge in most of the tissues, — the cutaneous surface closely approaching the colour of jaundice, but differing from it, in being more lurid and dusky, and in the absence of biliary obstruction. In low states of vital power, morbid secretions may be absorbed from the digestive canal, and thus affect the circulating fluids; and in a similar state of vital power, secretions or morbid matters in other situations, as from the uterus in the puerperal state, from abscesses, from disorganisation of the cellular tissue, &c., may pass into the circulation, and impart a lurid or jaundice-like tinge to the external surface and other parts. The contamination of the fluids and soft solids in the latter stages of chronic malignant maladies, as carcinoma, fungoid disease, is also attended by a change of the cutaneous surface resembling jaundice, but essentially differing from it. For the hue of the skin in these maladies proceeds from the admixture of morbid matters absorbed from the seat of local mischief, vitiating and tinging the serum of the blood of a deeper hue, and thereby rendering darker the *rete mucosum*; and not from the presence of bile, or even of its chief constituents, in the circulation (§ 63. *b.*). The lemon, yellowish, or even the yellowish green hue of jaundice, is very different from the lurid, dirty, or murky appearance of the surface consequent on these maladies. In these, the pale or clayey state of the stools, and the saffron tinge communicated by the cutaneous and urinary secretions in jaundice, are wanting, whilst the alvine evacuations are usually dark, morbid, and very offensive.

55. The appearance of the cutaneous surface in *chlorosis* resembles a slight attack of jaundice; and it is necessary not to mistake the one for the other. This will be avoided by attending to the age, the functions of the uterus, and to the evacuations. In chlorosis, the discharges are more natural than in jaundice, the perspiration and urine not communicating to the linen the saffron tinge observed in the latter complaint. In chlorosis also, and, indeed, in the latter stages of chronic malignant diseases, the waxy state of the integuments, and the smallness of the vessels, indicate a deficiency in the quantity, as well as in the quality, of the blood.

56. Instances, however, may occur, in which the morbid colour of the surface is increased in the course of cachectic and malignant maladies, by the absorption of bile into the circulation, or by the accumulation in it of the elements or principles of which bile is formed, owing to torpor of the liver. Indeed, this latter cause of heightened discolouration of the surface, in the course of these maladies, is by no means rare; for the liver largely partakes of the depressed state of vital power characterising them. When malignant disease occurs either in the substance of the liver, or in parts near the capsule of GLISSON, it is generally associated with jaundice, which gradually deepens from a lemon hue to a dark or dusky green colour, the urine assuming a greenish brown tint, and the patient sinking from exhaustion and coma. This association has been well illustrated by the recent researches of Dr. BRIGHT, which have appeared since this article was written.

57. XI. OF THE DISTINCTIONS MADE BY AUTHORS.—Jaundice has been variously *distinguished* — into *Idiopathic* and *Symptomatic*; *continued* and *recurrent* or *periodical*; *febrile* and *non-febrile*; and into *Yellow* and *Black Jaundice* — *Icterus* and *Melasicterus*. It has been further distinguished into *Inflammatory*, *Plethoric*, and *Nervous*; into *sporadic*, *endemic*, and *epidemic*; into the *mild* or *benign*, and the *malignant* or *pernicious*. —Jaundice is generally *sporadic*; but it is *endemic* in some localities, particularly in those which are low, humid, and warm; and which abound in terrestrial exhalations, as in some situations in the South of Europe, and among Europeans residing in various parts within the tropics, particularly in the Eastern hemisphere. It has likewise been so prevalent at some periods, especially in autumn and early in winter, even in temperate countries, as to have been considered *epidemic*.

58. *The malignant* or *pernicious* form of jaundice, noticed by writers, sometimes occurs in warm climates, and in marshy districts in the South of Europe, particularly during autumn, when low remittent or bilious fevers are prevalent. It entirely depends upon a general or diffused inflammation, or inflammatory congestion, of the liver, or both of the liver and spleen, with retention of the biliary and other secretions, great depression of vital power, deep or dark green discolouration of the skin, very quick pulse and febrile disturbance, terminating rapidly, sometimes with intestinal hæmorrhage, and always with delirium and profound coma. This form of jaundice is not, however, confined to the climates and localities just specified; as I have been called, within a short time, to two cases in London, which presented all the characters of the most *pernicious* state of the disease, and which terminated fatally in four or five days.

59. *Idiopathic* or *primary jaundice* has been denied, first, by BOERHAAVE and STOLL, and subsequently by PINEL, LOUYER VILLERMAY, GRIMAUD, and others; whilst it has been contended for by numerous writers. The truth is, that the difference between idiopathic and symptomatic, particularly as relates to jaundice, is often merely verbal, and is in a great measure relative. In a very strict sense of these terms, jaundice is never a primary complaint; whilst it may frequently be viewed as such, if we consider it, with many other maladies, as constituting the principal, and one of

the earliest morbid conditions, which can be recognised by our senses. According to this more obvious mode of distinction, the occasional occurrence of idiopathic jaundice, as after mental emotions, cannot be disputed. The variety usually attributed to spasm of the ducts, but which I have considered as depending rather upon a change in the state of organic nervous influence and functions of the liver than upon spasm, may, conformably with this view, be considered idiopathic.

60. The *classifications* and *distinctions of jaundice* by nosologists and authors require no further notice. Indeed, they do not deserve the space they would occupy, especially as SAUVAGES adduces *forty-six species*, arranged, according to the various causes, pathological states, and associations, which the complaint presents. Even VILLENEUVE has divided it into *thirteen species*, several of which are subdivided into many *varieties*, which do not admit of any distinction in practice.

61. XII. PROGNOSIS.—The prognosis necessarily varies with the age, sex, temperament, and habit of the patient, and the pathological relations and complication of the disease. — *A.* It is generally more *favourable* in young, than in old, subjects; and in those, in whom the energies of the frame are sufficient to bring about a return to the healthy functions, than in persons of a broken-down constitution, and with disorganised viscera. If it occurs in females from plethora, occasioned by the suppression of the menses, previous to the climacteric period; if the health has not been previously much affected, — if the abdominal viscera betray no marked disease, — if the respiratory function is unembarrassed, the heart's action regular and natural, and the vital energies not materially depressed; if the colour does not progressively deepen; if it proceed from the sudden, and violent emotions of the mind, as anger, fright, &c., or from bodily pain; if it arise from articles of diet or of medicine, which have disagreed with the digestive organs; if it depend upon plethora of the portal system, without inflammation or abscess, or on the passage of calculi along the ducts, in persons not far advanced in age, nor greatly debilitated; if a repelled eruption or suppressed discharge return; if the alvine evacuations are not much changed from their natural colour, or when the biliary secretion reappears; if the discolouration originate in temporary obstruction or pressure on the ducts, as in pregnancy, distension of the duodenum or colon; if the epigastrium and hypochondria are not constantly painful, or tender upon pressure; and if the disease seems to proceed from the more temporary causes of obstruction in the duodenum, or from spasm; the prognosis may in general be *favourable*; — yet I have seen jaundice exist in these circumstances, and where there seemed no reason to infer an unfavourable issue, and coma has suddenly appeared, and quickly carried off the patient.

62. *B.* An *unfavourable* prognosis, on the other hand, or, if not strictly unfavourable, a very guarded opinion, should be given, when this affection occurs after the cessation of the menstrual periods, or in aged females, or when it is caused by debauchery and intemperate indulgences, particularly in spirituous liquors. If symptoms of organic lesion of the viscera attend it; if the epigastrium and hypochondria be tumid, tender, and constantly painful, with heat of the palms of the hands and soles of the feet; if the respiratory function be impeded, or the circulation through the heart be irregular or obstructed; if the energies of life be depressed; if chronic disease have preceded the discolouration of the surface; if the colour deepen, be of long standing, and particularly if it be of a dark green hue; if it take place from the continued operation of the same cause, as grief, anxiety, and the depressing emotions; if the urine be small in quantity, white, or albuminous, or very dark, turbid, thick or blackish; if there be indications of supervening dropsy; if a colliquative form of diarrhœa supervene, or very dark, grumous, or pitchy evacuations, or vomitings of a nearly similar matter; if the affection be of long duration, and particularly if it be associated with dropsical effusions; if hiccup, with tumefaction of the epigastrium and hypochondrium, or a tympanitic state of the abdomen, be present; if delirium, delirium tremens, mania, epilepsy, lethargy, coma, paralysis, convulsions, or apoplexy occur; if intestinal hæmorrhage, or hæmatemesis, take place; if the jaundice proceed from calculi in aged persons, or appear after repeated attacks of ague or remittent fevers, and from continued melancholia; if it be accompanied with great depression of the mental and physical powers; if marked cachexia, and great emaciation, be present, and especially if it be complicated with internal or external malignant disease, a very unfavourable prognosis should be given.

63. XIII. REMOTE and PROXIMATE CAUSES.— The chief causes have been stated in what has been advanced respecting the pathological relations of jaundice. — *a.* It is obvious, that the more *remote* causes are those which induce the alterations, of which the discolouration is a symptom. These are fully detailed above (§ 15.), and in the articles CONCRETIONS — BILIARY; DUODENUM; GALL BLADDER AND DUCTS; and LIVER — *Diseases of.* Those, which most frequently induce this complaint, are — habitual excitement of the liver, duodenum, and digestive organs generally, by too rich, too stimulating, or too much food, or by spirituous or intoxicating beverages; sudden and violent mental emotions; anxiety, or the depressing passions; high ranges of temperature, indolence, and full living; vicissitudes of temperature; the ingestion of cold fluids when the body is perspiring; miasmata or exhalations from the soil, especially in connection with humidity of the air; suppressed discharges and accustomed evacuations; interrupted circulation through the heart, occasioning congestion in the vena cava and hepatic vein; previous disease, particularly periodic fevers, &c.; whatever depresses the energies of life, and at the same time favours internal visceral obstruction; and the organic changes already noticed.—*b.* The *proximate* cause of jaundice may be stated to be the passage of the colouring or other principles of bile into the circulation, and the consequent discolouration of the skin and other tissues, heightened in some of the varieties by the accumulation in the blood of the elements of which bile is formed.

64. XIV. TREATMENT.—There are few diseases which require so much discrimination, as to the *indications* and *means of cure*, as jaundice. It

proceeds in different cases, as shown above, from so many different pathological states, and sometimes from so many combinations of them, that the utmost attention and practical acumen are necessary to ascertain the morbid conditions and peculiarities of the case, and to determine what is most efficacious in removing them. It is requisite not merely to guard against vascular excitement on the one hand, and vital depression on the other; but in many cases, also, to prevent or to remove both, as being the more immediate causes of the obstructed secretion or excretion of bile. In all cases, the states of general and local organic nervous power, as well as of general and local vascular fulness or action, must claim particular attention; and, in many, it will be found requisite to aid the former, whilst we diminish the latter. In any circumstances, it is very difficult to ascertain what are the effects of remedies upon the circulation and functions of the liver; for much of what has hitherto been said and written upon the subject, has been characterised by dogmatism, rather than by truth, — by vague assertion, unsupported by evidence. Some of the medicines, which have been supposed to excite the liver, probably operate by removing slight obstructions from the mouth of the common duct, by reducing vascular turgescence in the duodenum, and carrying off mucous collections; and others, which have been viewed as inert, as respects this organ, have as great influence upon its functions, as those whose effects have been considered specific. The operation of medicines in affections of the liver so much depends on the state of vital activity and of vascular action, on the extent to which biliary collections may have formed, and on the facilities to its excretion, that facts are rarely observed with that degree of precision in all these relations, which should entitle them to confidence, or to be made data for practical inferences.

65. i. *Jaundice from an exuberant Secretion of Bile*, there being no evidence of its obstruction, is not so frequent in this, as in miasmatous and warm climates. In these especially, the treatment must have due reference to the remote causes, and to the more immediate source of the biliary exuberance. In temperate climates, and in European constitutions, this state of the biliary function is connected with biliary remittent fever, and is most appropriately treated by the means most serviceable for the constitutional affection; but it sometimes continues, or returns, after the fever has disappeared. In these cases, as well as in those where it presents a more idiopathic character, there is every reason to infer the presence of active circulation in, or vascular determination to, the liver, probably with increased activity of the absorbent function. For them, moderate *local depletion* from the margins of the ribs, or from below the shoulder blades; *cooling diaphoretics*, especially the nitrate of potash, the solution of acetate of ammonia, or subcarbonate of soda, and spirits of nitric æther in camphor mixture; *emollients* and *demulcents*; soothing enemata and *diluents*; are the most efficacious means, particularly when the causes no longer exist, or when the patient is removed from the influence of miasmatous exhalations, or enjoys a dry and pure air.—The *diet* in these cases should be very spare, and consist of mucilaginous and farinaceous substances; animal food should be taken sparingly and cautiously during convalescence, and stimulating beverages entirely relinquished.

66. ii. *Jaundice from Inflammation of the Substance of the Liver* is more frequent than is generally supposed. It is often merely an exalted state of the former variety; the vascular disorder having advanced to such a pitch, as to obstruct the secretion or excretion of the bile, owing to the general turgescence of the vessels, and consequent pressure on the minuter bile ducts; and it is most frequently observed, when the internal structure of the organ is generally inflamed, or is the seat of one or of several abscesses. (See LIVER — *Inflammation of.*) When the attack is *slight*, and is attended by little pain, or by pain increasing slowly after pressure; and when there is little fever, the pulse being oppressed, rather than much accelerated; *local depletions* from the margins of the ribs, and from the anus, with the other means just advised (§ 65.), will generally remove all disorder. But when the bowels are costive, additional means will be required, especially *mercurials* with antimony; *saline medicines*, either alone, or with other *aperients;* a solution of sulphate of magnesia in camphor julep, with the solution of the acetate of ammonia, and spirits of nitric æther; the warm turpentine epithem applied over the epigastrium; the warm bath, &c.

67. In the more *acute cases*, particularly when there are much fever, intensely deep jaundice, very quick pulse, dry tongue, flushed countenance, and scanty, dark urine, the treatment should be most actively antiphlogistic. — General *bloodletting* ought to be early employed, and be followed by local depletion; by full doses of *calomel*, or of calomel with *James's powder*, camphor and opium; by *saline aperients;* by *antimonials* and saline *diaphoretics;* and by the rest of the means advised in the article on *Inflammation* and *Abscess* of this organ. In all such cases, the treatment should vary according to the history of the case, particularly in respect of previous disease of this viscus, and to the habits, age, and other circumstances of the patient. If the treatment be not active at the commencement, and in some instances where it has been both active and judicious, delirium and coma will supervene in four or five days, or even earlier, if vital power be exhausted, and if the discolouration be very deep. In this stage, treatment will seldom be of much avail. The propriety of then having recourse to depletion will entirely depend on the strength and frequency of the pulse, on the state of the hepatic regions, and on the means previously employed. In some, local depletions may still be resorted to; but, in all such, camphor with other mild restoratives will be appropriate. Calomel will seldom be of any use at this period, if it have been already liberally prescribed. If it have not been employed, it may be given with camphor. Some benefit may accrue from an occasional exhibition of a draught containing spirit of turpentine with, or without, castor oil; from the same substances administered in enemata, from the warm turpentine epithem applied over the epigastrium and hypochondria, and from a large blister on the nape. When jaundice is dependent upon abscess of the liver, the

treatment must be conducted as advised for this state of disease, in the article LIVER.

68. iii. *Jaundice from Congestion of the Portal and Hepatic Veins* often requires very nearly the same treatment, as just recommended for the slighter states of the preceding variety (§ 66.). — *Local bloodletting* is generally sufficient; and, unless in cases where the congestion depends upon dilatation of the cavities of the heart, the application of leeches to the anus is preferable to cupping over the hypochondria. If the congestion is connected with a stoppage of the hæmorrhoidal flux, leeches are especially serviceable. When congestion is chiefly in the hepatic veins, the circulation through the heart and lungs is often interrupted, and the congestion soon extends to the portal system, to the mesenteric veins, and the digestive mucous surface; the early stage of jaundice being characterised by a bloated appearance of the face, sometimes with lividity of the lips, and a deficiency, merely, of the bile in the stools. In these cases, the treatment should be chiefly directed to the primary complaint, and be modified according to the evidence furnished of the cause of obstruction. (See HEART — *Organic Lesions of.*) — When *hæmorrhage* from the digestive or respiratory mucous surface occurs in this variety, as sometimes observed, *cupping* from the sternum, or leeches applied to the anus, will be of service. In many cases of this kind, the liver is more or less enlarged, owing to the prolonged congestion; and, although there can be but little expectation of a permanent restoration of this organ to its functions, whilst the obstruction to the circulation continues, deobstruent and saline *purgatives* will generally be useful, especially mercurials, the bitartrate of potash with the sub-borate of soda and confection of senna, the preparations of taraxacum with soda, and the hot turpentine epithem placed on the abdomen, &c. — *Dropsical effusion* sometimes takes place in the advanced course of this form of jaundice, and requires *diuretics*, in addition to the decided exhibition of the medicines just named. The internal and external use of the spirits of turpentine; the compound decoction of broom with the acetate of potash, or with carbonate of soda, and spirits of nitric æther; weak solutions of the hydriodate of potash, or the solution of potash; occasionally the more drastic or hydrogogue *purgatives*; and a course of deobstruent *mineral waters*, such as those of the Beulah Spa, of Cheltenham, Pullna, Seidschutz, &c.; will sometimes be of service.

69. iv. *Jaundice from Chronic Organic Lesions of the Liver* requires a treatment modified according to the history of the case, and the signs furnished by a careful examination of the hypochondria, and even of the lower regions of the thorax. If the patient have had attacks of acute or subacute hepatitis or dysentery, or is subject to chronic dysentery or diarrhœa, very probably the circulation through the extreme branches of the portal vein, and the passage of bile along the small ducts, are obstructed by a deposit of albuminous lymph from the inflamed vessels in the areolæ or reticulations of the connecting cellular tissue of the organ, and by the pressure on these vessels thereby occasioned. In cases of this kind, more or less enlargement of the liver may be detected, especially in those which are less chronic; although, in the more protracted, the liver may have regained its former size, or have become even smaller, its structure being dense, granulated, or otherwise changed. In these latter, the nutrition of the organ, as well as its functions, is impaired; and the deposits formed in the substance of the organ become organised, or partially identified with it, and perpetuate the obstruction. In this variety, particularly in the less prolonged instances of it, the *exciting causes* of the hepatic disorder should be avoided. — *Diet* and *regimen* will very much assist the treatment. Stimulating food and drink should be relinquished, and *deobstruents* and *alteratives* adopted. If any remains of inflammatory action still exist, *leeches* should be applied to the anus, or to the epigastrium. In any circumstances, PLUMMER's *pill* should be taken regularly at bedtime, either alone, or with a little *soap* and extract of *taraxacum* (F. 503. 511.), and the *bitartrate of potash*, with the *sub-borate of soda*, in any vehicle, or with other medicines, according to the state of the bowels (F. 89. 96. 98.).

70. If *evacuations of blood* from the bowels occur, the *hydrargyrum cum cretâ* with *ipecacuanha*, enemata containing *spirit of turpentine*, or an occasional draught with this substance and castor oil, or the *nitric* or *nitro-muriatic acids* in the simple infusion of roses, will be useful. In all cases, frequent *frictions* over the hypochondria and epigastrium with an oleaginous and deobstruent *liniment* (F. 297. 311.), or with this conjoined with the mercurial liniment, will be of essential benefit. This variety, like the preceding, is very apt to become complicated with *anasarca* or *ascites*, or with both. In this case, the decided use of *mercurials*, the more drastic and hydrogogue *purgatives*, the bitartrate of potash in large doses with borax, *diuretics*, and the other means noticed above, and advised for DROPSY, proceeding from disease of the liver, will be requisite. Assiduous frictions of the hypochondria and abdomen with *liniments*, particularly with these just mentioned, or with those containing the *iodide of potassium*, and a course of deobstruent and purgative *mineral waters* (§ 68.), will sometimes be of use.

71. v. *The more doubtful Source of Jaundice in Spasm of the Ducts* requires means which have a stricter reference to the remote causes, and to the symptoms peculiar to the case, than to the existence of spasm. A large proportion of the cases usually attributed to this state, most probably would have been found, upon a more accurate investigation, to belong either to congestion of the hepatic veins; or to calculi lodged in the ducts; or to obstruction of the mouth of the common duct, arising from the states of the duodenum; and they consequently would have required a similar treatment to these. The affection attributed to the ducts may have been almost entirely confined to the duodenum; the means found of service, as *calomel* alone, or with *opium*, saline or other *purgatives*, *anodynes*, *emetics*, &c., instead of acting upon the former, actually removing the disorder of the latter, or carrying off mucous sordes from its surface, or subduing vascular turgescence from around the opening of the common duct. — When there is any reason to suppose that the reputed spasm of the ducts is actually a paralysed state of the organic nervous influence of the liver and ducts, *restorative means* will then be required. The

chlorate of potash with carbonate of *soda*, gum *ammoniacum* with Castile soap, the nitric or *nitro-muriatic acids* given internally, or the nitro-muriatic acid lotion or bath, *frictions* with stimulating liniments on the hypochondria, the ammonical and mercurial *plaster* in this situation, and *blisters*, will be severally beneficial in cases of this kind, as well as in the immediately preceding variety, when the energies of life are much exhausted.

72. vi. *Jaundice from Obstruction of the Ducts* (§ 35.).—When the obstruction depends upon the *passage of calculi*, as evinced by the symptoms noticed above (§ 39.), and more fully described in the article, Concretions — Biliary (§ 6.), the means fully detailed in that article (§ 14.) should be resorted to, especially full doses of *opium*, alone or with antimony, of *belladonna*, or of other narcotics; the *warm bath*, warm *fomentations*, or the *turpentine epithem* on the abdomen, &c. No advantage, but rather mischief, results from the exhibition of mercurials in this state of the disease. When the obstruction arises from *compression, inflammation, and obliteration of the ducts* (§ 38.), in some part of their course, or even near their entrance into the duodenum, as from malignant tubera or other organic changes in the liver, or in the vicinity of the capsule of Glisson, and from the organic lesions of the duodenum and pancreas already noticed, Dr. Bright considers that the evacuation of fatty matter in the stools is not infrequent, especially if the biliary obstruction is permanent. In these cases, jaundice assumes a dirty or dark green hue, and is but little benefited by treatment; emaciation, exhaustion, hæmorrhage from mucous surfaces, or coma, supervening, and terminating existence. Palliative means, however, should be employed, especially *opiates*, the *solution of potash*, or of the *iodide of potassium*, with extract of *conium* or *hyoscyamus*. The constitutional powers should be supported by mild tonics and gentle nourishment, and irritation of the stomach allayed by opiates and salines given in aromatic vehicles, or by other appropriate remedies.

73. vii. *The other States and Associations of Jaundice* require the same principles and means of cure as have been stated, according to the peculiarities of individual cases. — *a.* This especially obtains in respect of *green or black jaundice*, the most appropriate means for which have been just noticed (§ 46.); and in regard of *the complications and successions of jaundice* (§ 49.), which usually present one or other of the pathological states already considered, particularly under the first, second, and third varieties.

74. *b.* For *cachetic* or *pseudo-jaundice* (§ 45.), the remedies mentioned in the articles Cachexy, Chlorosis, Cancer, Fungoid Disease, &c., may be resorted to, when these or any other malignant malady resembles jaundice, owing to contamination of the circulating fluids, or is associated with it. In such cases of contamination, as well as in the very acute and febrile form of jaundice, denominated *malignant* or *pernicious* (§ 58.), the alkaline carbonates with camphor, solutions of the chlorate of potash, or of chlorinated soda; and the other means advised for the hepatic complications of *Typhoid* and *Putro-adynamic* Fevers (§ 49.), will be most appropriate.

75. *c. Traumatic jaundice* (§ 52.) must be treated according to the symptoms evincing the existence of any of the pathological states and alterations above referred to (§ 26.), and conformably with the principles already stated.

76. *d. Infantile jaundice* (§ 53.) requires merely gentle aperients, especially the *hydrargyrum cum cretâ*, with dried *subcarbonate of soda* and *rhubarb*, with an occasional dose of *castor oil*.

77. viii. *Of various Remedies recommended by Authors for Jaundice.*—*A. Antiphlogistics* are advised by numerous writers in the treatment of jaundice. Stoll supposed that these means are more necessary in this complaint during winter or spring, than at the other seasons. — *a. General bloodletting* is directed by Hippocrates, De la Motte, and others. Zacutus Lusitanus also recommends it, but with the utmost caution. Dr. Bright very properly limits it to the more acute or inflammatory cases. I have attempted above (§ 66. 67.), to point out the circumstances and varieties, in which it, as well as *local depletion*, should be practised; and have mentioned the situations where this latter may preferably be employed. — *b. Emetics* are prescribed by Hippocrates, Cælius Aurelianus, Horstius, Lentin, Hoffmann, Brocklesby, Stoll, and Conradi. When diffused inflammation, or even congestion, of the liver is present, or when gall-stones are passing the ducts, they may be attended by some risk; but when inflammatory symptoms and pain are absent, and when the liver is not apparently enlarged or congested, they may be productive of benefit. — *c. Laxatives* and *purgatives* are much safer than emetics, and more generally appropriate. Hippocrates, Galen, Forestus, Ruland, &c., placed great dependence upon them. Much, however, depends upon the selection of them, appropriately to existing pathological states. Schneider prefers the combination of *senna* with *guaiacum*; Otto, *aloes* with *soap*; Lentin and Horn, *rhubarb* with *bitartrate of potash*; and the majority of recent writers in this country, *calomel* or *blue pill*, alone, or with other purgatives. I have found, after one or more doses of these last, that any of the former will be very serviceable, especially the bitartrate of potash in large doses, either with the sub-borate of soda (F. 790.), or with the confection of senna, or with this and guaiacum, according to the pathological states inferred to exist. Other purgatives will, nevertheless, be often equally beneficial; but, in the more inflammatory cases, the more cooling should be selected: and when a torpid state of the liver, or deficiency of vital action in it, is inferred, then the warmer, more stimulating, or stomachic aperients should be prescribed, and be aided by the other means advised for this state. — *d.* The *diet* should also be suited to the treatment; and where depletions and evacuations are required, it ought to be most spare, cooling, and chiefly mucilaginous, or consist of the mildest of the farinaceæ.

78. *B. Diaphoretics and sudorifics* are prescribed by Cælius Aurelianus, Riedlin, Stoll, Richter, &c.; and *antimonials* are the remedies belonging to this class, which are preferred by modern writers. When conjoined with other remedies, they are of much service; as with nitrate of potash, and the spirits of nitric æther, in the more inflammatory states, and with anodynes and opiates in some other circumstances.—The *warm bath*, the *vapour bath*, *fomentations*, and *warm poultices* may also be noticed under this

head, as being sometimes useful. A diaphoretic, as well as a deobstruent, effect is also produced by a combination of calomel with antimonials and opium, or of calomel, camphor, and opium; and is often of great benefit in the more imflammatory varieties, after general or local depletions.

79. *C. Deobstruents and alteratives* of various kinds are much insisted on by Lentin, Stoll, and most modern writers. Several of these, suitable to the more chronic cases of jaundice, are prescribed in the Appendix (F. 503. *et seq.*).— *a.* The deobstruent effects of *mercury* in this complaint are much confided in by Desault, Thomann, and most recent writers; but there is little agreement between them, as to the preparation which should be preferred, or as to the extent to which it should be pushed. Gibbon and others prefer *calomel*, and give it until it produces salivation. In the more chronic cases especially, I prefer Plummer's *pill* with *soap* and *taraxacum*, occasionally aided by *mercurial liniments*, or *plasters*, applied to the hypochondria. — *b.* Simple or medicated *soaps* are much praised by some authors, and particularly by Boyle, Stoerck, Ranoë and Quarin. They are often very useful, either alone, or with taraxacum, mild mercurials, oxgall, assafœtida, or with ammoniacum, or even with narcotics. The *alkaline subcarbonates*, and *solution of potash*, are also serviceable in similar combinations, and, as well as the soaps, are safe medicines in all states of the disease. — *c. Taraxacum*, in decoction or extract, has been much used in jaundice, since it was praised by Ranoë and Quarin; but it should be given in large doses, or be aided by other medicines, as the alkalies, soap, neutral salts, &c. I have given it with small doses of *colchicum*, and in other combinations. (F. 76, 77. 392.)—*d.* The *Solanum dulcamara* was recommended by Linnæus for jaundice, but it is rarely prescribed, although much used as an alterative in cutaneous eruptions depending upon, or connected with, biliary disorder. It may be advantageously given in decoction with taraxacum and the alkaline subcarbonates, or with the other alteratives already noticed (F. 59.), Plummer's pill being taken at night. — *e.* I am not aware that the preparations of *colchicum* have been recommended for this complaint by writers. I have, however, prescribed it in several cases with marked benefit, chiefly in conjunction with mild mercurials, or with soap, alkalies, &c., or with magnesia or neutral salts, according to circumstances. It should be given in small doses, be continued for a considerable time, and carefully watched. If there be much debility, or if it produce depression, it should be given with camphor, or the more tonic substances recommended for the complaint. It often increases the biliary secretion in the cases depending upon chronic inflammatory action, or enlargement of the liver; and promotes resolution of the former, and diminution of the latter, morbid state. —*f.* I have also given the preparations of *sarsaparilla* with advantage, in conjunction with the liquor potassæ.

80. *f.* The internal use of *nitric acid* was advised by Frank. It is likely to be useful in some of the more chronic states. The *nitro-muriatic acid* was praised by Scott, Annesley, and others. I have found it decidedly beneficial in some cases; but have, contrary to the usual mode, prescribed it internally as well as externally. It may be employed as a warm foot-bath, or as a lotion, applied warm or tepid, over the hypochondria and epigastrium. It is most serviceable in torpid states of the liver, and in the more chronic cases. It should not be employed when inflammatory action is present. — *g.* The *chlorate of potash*, or the *chlorinated soda*, will be sometimes useful in the circumstances or conditions of the disease in which these acids are indicated. The chlorate of potash may be advantageously conjoined with the carbonate of soda, or with other substances. — *h.* The preparations of *iodine* are sometimes also of service, in similar states of jaundice to those just alluded to, especially the *hydriodate* and the *iodides of mercury*. These may be given with *conium* or other narcotics, particularly where there is reason to infer the existence of chronic obstruction, or malignant disease of the liver, or of adjoining parts. — *i.* The *liquor potassæ* is also indicated in such cases, and in similar combinations.

81. *D. Diuretic deobstruents* are sometimes prescribed, but chiefly as adjuncts to aperients. They are noticed by Hippocrates and Riedlin. The *acetate of potash* (F. 841.) is the most useful of this class; but the *bitartrate* is equal to it as a diuretic, and even superior to it as a deobstruent in diseases of the liver, when given in large doses, so as to act upon the bowels, or when combined with the *sub-borate of soda* (F. 790.). Several of the foregoing medicines will be aided in their operation by emollient and mucilaginous diluents, as directed by Gilibert and others.

82. *E. Frictions* of the hypochondria and upper regions of the abdomen with stimulating and *deobstruent liniments* have received much less attention than they deserve. Indeed, they have hardly been noticed. When acute inflammatory action is not present, they will be found of much service. Several of those contained in the *Appendix* (F. 297. 311., &c.) may be prescribed either alone, or with *iodide of potassium*, or the *mercurial liniment*. Subsequently the ammoniacal and *mercurial plaster* may be kept applied to the side.

83. *F. Anodyne antispasmodics and narcotics* are directed by Vogler, Richter, Hufeland, Vogel, Brandis, and Conradi, chiefly on the supposition of jaundice being often a consequence of spasm; and ipecacuanha with opium is generally adopted by them. As this complaint often gradually disappears upon the cessation or removal of the remote cause which occasioned it, much of the benefit, that seems to follow these substances, probably depends upon this circumstance. When the disorder proceeds from the retention of a calculus in the ducts, they are probably useful in relaxing the parts, and thereby facilitating the excretion of it. — *Opiates* in full doses are prescribed by Wendelstatt, Vogler, Thomann, De Chave, &c.; and *belladonna*, by Greding. In the states just named, and when severe pain is present, the advantages derived from them are unquestionable, whether exhibited alone, or with calomel, or with alkaline subcarbonates, or with camphor and emollients.

84. *G.* Of *stimulating antispasmodics*, the *spirit of turpentine* is the most deserving of notice. It is recommended by Holst, Odier, and Durande. I have prescribed it with benefit in several varieties of the complaint, and in various modes, as already stated (§ 70.). — *Assafœtida* is mentioned by Herz: both it and *ammoniacum* are sometimes

of use in cases depending on torpid states of the liver, especially when conjoined with soap, alkalies, and other medicines already noticed. (See Form. 503—510. 891. 894.)—An infusion of the flowers of *arnica* was also prescribed by Plenciz and Stoll.

85. *H. Vegetable tonics and bitters* are directed by Riverius, conjoined with aperients; and are often of great service when thus exhibited, and when aided by the alkaline subcarbonates or neutral aperient salts.—The *absinthium* is recommended by Celsus, De Hayde, and Solenander; and *cinchona*, by Cammerarius, Fahner, and De Haen. This latter is prescribed with antimonials by Cornette; but it should be given with caution, as it is contra-indicated in the more inflammatory states of jaundice. I have had reason to believe it to have been even productive of the complaint, when exhibited freely in periodic fevers, before morbid secretions had been fully evacuated. The milder tonics and simple bitters are preferable to it in most cases, especially when they are prescribed as advised by Riverius, and when given during convalescence.

86. *I.* Of the *other means* advised by authors, there are few requiring particular notice. The watery extract of *Chelidonium*, and the extract of *Chicorium*, were recommended by Riverius, Lange, De Schullern, and others; the *Anagallis* with salines, bitters, and the ammonio-chloride of iron, by Stoll; the *Agrimonia*, by Hill; and the *Gramen caninus* and the *Berberis vulgaris* (F. 225.), by several writers. Inspissated *oxgall*, in as large doses as the stomach could bear, was prescribed by Stoll. *Blisters* on the hepatic region were directed by Bang; and *electricity*, by Hall and Darwin. The *mineral springs of Cheltenham*, of *Bath*, or of the *BeulahSpa*; the artificial mineral waters of *Seidschutz* and *Pullna*, or of *Ems*, *Eger*, and *Pyrmont*; are severally beneficial, when taken appropriately to the pathological states of the complaint. *Travelling* and *change of air* were much praised in jaundice by Celsus and Cælius Aurelianus, and in modern times by Gregory and others. Regular *exercise* on foot and on horseback is always of benefit, unless in cases depending upon inflammatory action.

87. The *Diet* and *Regimen* should be suited to the forms of the disease. — *Asses' milk* is advised by Hippocrates. *Common whey* and *goats' whey* are the best beverages that can be used during the attack. The drinks also prescribed under the head *Potus* in the *Appendix* (F. 588. *et seq.*), will generally be found useful. Upon the whole, the *diet* should be very nearly as advised in the article Concretions — Biliary (§ 18.).

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ICHTHYOSIS. — Syn. Derived from ιχθυς, gen. υος, a fish. *Albaras nigra*, Avicenna. *Impetigo excorticativa ; Lepra Ichthyosis*, Sauvages. *Ichthyosis*, Willan. *Lepidosis Ichthyosis*, Young. *Lepidosis Ichthyosis*, Good. *Ichthyose*, Fr. *Fischschuppenaussatz*, Germ. *Ictiosi*, Ital. *Fish Skin, Fish Skin Disease.*

Classif. — 6. *Class*, Diseases of the Excernent Function ; 3. *Order*, Affecting the External Surface (*Good*). 2. *Order*, Scaly Diseases ; 4. *Genus* (*Willan*). IV. Class, IV. Order (*Author*).

1. Defin. — *Morbid enlargement of the papillæ of the skin, and thickening of the lamellæ of the epidermis, either in parts, or over the general surface, presenting irregular compartments, and resembling in many cases the scales of fish.*

2. *Ichthyosis* is defined by Willan and Bateman, to be a papillary, indurated, and horny condition of the skin, to a greater or less extent. It has been placed by them among squamous diseases, but more recent writers have justly contended that it does not belong to this order. It consists of a morbid enlargement and elongation of the papillæ, and a thickening of the epidermis. Horny peduncles are thus formed, which spread so as to acquire broad irregular tops, and, undergoing partial exfoliation, sometimes resemble the scales of a fish.

3. This affection is *general* or *local*, and *hereditary* or *accidental*. When it is hereditary, it either is congenital, or it does not appear until some months after birth. The local form is most frequently accidental, the more general affection is commonly congenital or hereditary. The states of the complaint have been differently divided, and even described, by writers. The division and description of Dr. A. T. Thomson, are altogether incorrect, inasmuch as he confounds, as M. Rayer has shown, a disease of the cutaneous follicles with this affection, and mixes up a description of both, under the denomination of *Fortuitous Ichthyosis.*

4. I. Description. — i. *Hereditary Ichthyosis* is commonly general, affecting those places chiefly in which the skin is naturally thick and the epidermis rough, and being entirely wanting on the prepuce, eyelids, groins, axillæ, and on the palms of the hands and soles of the feet. When the disease is *congenital*, it is usually but little apparent ; but the skin, instead of being soft and smooth, is sallow, dry, and shagreen-like. In the course of the two first months, the cuticle becomes, particularly in places, rough, thick, and of a greyish or sallow hue. It may remain in this state for years, or even during life, without proceeding further ; but the alteration may increase until it is very remarkable.—Ichthyosis sometimes does not appear until several months after birth. It is then often developed more rapidly, until the epidermis is divided into small irregular compartments, resembling that covering the legs of fowls, or the scales of serpents, the "*Ichthyose nacrée serpentine*" of Alibert.

5. Hereditary ichthyosis is sometimes limited in extent, and is confined chiefly to the extremities. It is then still more remarkably developed, and assumes the appearance of a thick epidermic layer, or of the bark of certain trees. In these cases, as in the foregoing, the epidermis is composed of a number of small compartments of irregular shapes, which are not imbricated, are from two to three lines in diameter, but are often broad in proportion as they are thin. The morbid surface is generally greyish or sallow ; sometimes of a brownish hue ; but, in a few cases, it is shining or opalescent. It is so rough, that it feels like shagreen, or like the surface of a file, when the hand is passed over it, — "*Ichthyose nacrée cyprine*" of Alibert. — In these states of the complaint, the epidermis is chiefly altered ; and the scales, excepting the largest, which adhere strongly, may be removed without causing much uneasiness. But, however detached, they are soon reproduced.

6. ii. *Papillary Ichthyosis*, or that in which there is chiefly a *remarkable elongation of the papillæ* of the skin, is a very rare variety. The first case of this kind, which was minutely described, was that of a native of Suffolk, who exhibited himself, in 1710, under the name of the *porcupine man*. More recently a family of the name of Lambert, affected with this variety, were described by Geoffroy St. Hillaire, and others. About 1830, I examined a very remarkable case, which was seen by many of the medical men of the metropolis. In all these instances, the complaint was confined to the males of a family. The brothers Lambert could trace it back through five generations, all of which were affected with it. The alteration of the skin appears to have been the same in all the cases, and identical with that which I examined. The *papillæ* were remarkably hypertrophied and elongated, over nearly the whole of the cutaneous surface, excepting the prepuce, axillæ, groins, eyelids, soles of the feet, and palms of the hands. Over the rest of the body, the elongated papillæ presented the form of short spines closely pressed together. They were whitish or greyish when separated, but blackish or brown on their exposed surface : and so hard and elastic, that they produced a noise when the hand was passed quickly over them. These productions have generally exuded a reddish brown serum, when divided close to their bases, and have soon been reproduced. They could not be removed without pain.

7. iii. *Accidental and Local Ichthyosis* is a very distinct form of the disease from the foregoing, and is generally produced by pressure. It sometimes occurs on the lower and anterior parts of the thighs of shoemakers ; and in other parts, where pressure is made, in various employments. It thus resembles corns in its mode of production.

8. In *the several forms of ichthyosis*, the morbid

cuticle is generally thrown off in summer, or at other seasons, but it is soon after reproduced. Rayer states that the skin, divested of its squamæ, shows no appearance of inflammation; and that its colour is natural, only the shallow furrows on the surface are more remarkable than usual. The cutaneous perspiration and follicular secretion are suppressed. The complaint is not attended by pruritus, or by any other morbid sensation: the general health is unaffected by it. When it is general, copious perspirations take place from the soles of the feet, palms of the hands, and other parts above stated to be free from it. The pulmonary exhalation and urine are probably increased, in proportion to the diminution of the cutaneous exhalation. Rayer thinks, that persons affected with ichthyosis are liable to be attacked with acute inflammation of the skin, which throws off the morbid cuticle; but the original complaint is soon afterwards reproduced.

9. iv. *The Anatomical Changes* constituting ichthyosis have been described by Tilesius, Buniva, and Rayer. The small compartments, into which the epidermic layer is divided, do not overlap each other like the scales of fish: hence the term ichthyosis is inappropriate. These layers, according to Buniva, consist chiefly of gelatine, hardened by phosphate and carbonate of lime. M. Delvaux states, that they contain also traces of iron and of silica. They present the same chemical constituents as the hair, nails, &c. The lines or furrows of the surface of the corion are more distinct, and the papillary eminences more decided, in this complaint, than in the natural state. Tilesius found the cutaneous follicles obstructed, and full of a thick substance, in *the papillary variety* (§ 6.); and in the *squamous varieties* examined by Rayer, these follicles were but little apparent, or imperceptible. Dr. Martin observed the hair and hair-bulbs remarkably enlarged; and the corion is usually thicker, harder, and denser than natural. Ichthyosis appears to be unconnected with any internal disease.

10. II. Diagnosis.—This affection is improperly classed by Willan and Bateman with squamous diseases, for it is entirely independent of inflammatory action. True ichthyosis always commences in a few months after birth, if it have not already existed; for the local variety can hardly be considered as connected with it, otherwise than in external appearance, and in the absence of inflammation. — In *lepra*, *psoriasis*, and *pityriasis*, the formation of scales is constantly preceded by redness of the skin: *lichen* is attended by severe pruritus, and preceded by the eruption of papulæ; and the scaly condition of *chronic eczema* is quite distinct from local ichthyosis. Ichthyosis, on the contrary, is attended neither by heat nor by pruritus, and is perfectly free from every inflammatory symptom. The *horny* or *warty productions* on the skin, — the former of which has been classed by Willan and Bateman with this complaint, — are entirely different from it, not only as to the form of the morbid formation, but also as to the extent of surface affected; these productions being limited to one or more points of the cutaneous surface.

11. The *ichthyosis of the face*, noticed by Dr. Bateman and Dr. A. T. Thomson, has been more correctly described by M. Rayer, who has shown it to consist of a *sebaceous deposit* from diseased follicles. I have met with one instance of this affection, extending over, and on both sides of, the nose. It is always associated with inflammatory action, in its developed state. The following is the description of it by Rayer: — "The part of the integument affected, becomes, at first, unctuous or oily: the secretion of the sebaceous follicles then increases; the fluid thrown out upon the surface acquires additional consistency, and finally forms a kind of *squamous crust or layer*, of greater or smaller extent. Soft at first, and adhering but slightly, it by and by acquires hardness, and then cannot be removed without very considerable pain. The skin under this sebaceous deposit is of a vivid red; the orifices of the follicles appear dilated, and sometimes distended with concrete sebaceous matter."

12. III. Causes.—M. Rayer considers general ichthyosis to be a not infrequent disease. He has seen upwards of forty cases of it. It is known to be transmitted through several generations, and only to the male offspring. The whole of the male children of the same father and mother, who were themselves free from it, have been affected with ichthyosis. This was the case with two brothers, one of whom was in the Hospital "*De la Charité*," in 1827. This disease is very seldom produced accidentally long after birth. Neither climate, nor temperature, nor mode of life, exercises any influence in causing it. Some have ascribed it to moral affections of the mother during pregnancy; but this is extremely problematical. That it may be congenital, without the parents having been affected by it, is shown by a fact stated by Rayer: — He was consulted respecting three little boys who had it congenitally. Both parents were quite healthy and well formed, and the mother had never experienced disquietude nor alarm during these three pregnancies. It is very rarely observed in females.

13. IV. Prognosis.—Hereditary, or congenital ichthyosis, frequently disappears for a time in consequence of acute inflammation of the skin; but a person affected with it can hardly be considered as likely to be permanently cured of it. Accidental and local ichthyosis, however, often yields to treatment.

14. V. Treatment.—i. *Hereditary ichthyosis* of considerable extent has rarely been permanently cured. M. Rayer states, that he has not succeeded in a single case. Happily this alteration of the skin is unattended by internal disorder, and is thus, comparatively, of little consequence. Emollient applications long continued, gentle frictions, mucilaginous and soothing fomentations, tepid baths frequently repeated, or alternated with the watery vapour, or the alkaline warm bath, have been severally employed in clearing the skin from the scales covering it, or in preparing it for the application of other remedies. Willan and Bateman prescribed without benefit various plasters, stimulating lotions, and other topical applications. Mr. Coulson resorted to a wash containing corrosive sublimate, in a boy, who was under his care; and subsequently, a liniment consisting of half an ounce of the ointment of nitrate of mercury and an ounce of olive oil, which was applied twice in the day. The scales soon disappeared, but the brown colour of the skin still continued. Willan recommends tar and pitch for this complaint; and gave as much as half an ounce, or even an ounce, daily, for some months:

and Bateman adopted the same treatment, with advantage both to the local affection and to the general health. Dr. Elliotson, for one of two brothers affected with ichthyosis, prescribed a warm bath every day, and desired the patient to anoint himself, on coming out of it, with oil; gentle friction of the surface, with sweet oil being employed twice a day besides. *Pitch* was also given internally, and increased gradually until ten scruples were taken three times in the day. The patient was clothed in flannel; was advised never to wipe the surface of his body after having anointed himself; and was directed to wear the same flannel shirt, drawers, and stockings, so that his skin was kept impregnated with oil. In about six or seven weeks the disease disappeared, the skin being soft and supple. The pitch produced no effect on the organs of digestion; and it neither was mixed with, nor had altered the smell of, the evacuations. Dr. Elliotson refers to two instances of the disease having been cured by Dr. Willan, by the use of pitch taken to the extent of an ounce daily. In Dr. Elliotson's case, no benefit was derived from the warm bath, as it produced smarting of the surface after the removal of the thickened cuticle; but the use of the oil probably accelerated the cure. The arsenical solution has also been tried, but with either very little or no benefit.

15. ii. For *local or accidental ichthyosis*, flying blisters, or topical stimulants, have been directed. Gentle frictions with a flannel cloth after coming out of a simple or sulphureous tepid water bath, and the sulphureous fumigating baths, aided by active exercise, have been found most serviceable in this form of the complaint. Mr. Plumbe succeeded in two cases, in removing this alteration of the skin, which was limited to the legs, by strapping the parts tightly with adhesive plaster, and applying a roller kept constantly moist with cold water. The straps were removed every fourth or fifth day. On the whole, this affection has been found to be very little under the control of medicine; and, notwithstanding the most active treatment has been adopted, the disorder has been known to continue for several years, with occasional variations.

16. iii. The *affection of the sebaceous follicles* of the face, mistaken by Dr. A. T. Thomson for ichthyosis, was successfully treated, by the decoction of the dock root, or the *Rumex obtusifolius*. It is prepared from one ounce of the sliced recent root, boiled in two pints of water down to one pint. The dose is a wine glass full three times in the day. It may be taken alone, or with the arsenical solution; if it should purge too briskly, a few drops of the tincture of opium may be added to each dose.

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ILEUS. — *See Colic.*

IMPETIGINOUS AFFECTIONS. — Syn. *Impetigo* (from *impeto*, I attack or infest), Celsus, Pliny. Λειχην αλφος, Galen. *Lepra Squamosa*, Auct. var.; *Herpes*, *Phlyctæna*, *Lichen*, &c., Auct. *Phlysis Impetigo*, Young. *Ecpyesis Impetigo*, Good. *Dartre*, *Dartre crouteuse*, Fr. *Zittermal*, *Ringwarm*, Germ. *Impetigine*, Ital. *Tetter*, *Humid or Running Tetter*.

Classif. — 3. *Class*; 3. *Order* (*Cullen*). 6. *Class*; 3. *Order* (*Good*). 5. *Order*, Pustular Eruptions (*Willan*). III. Class, I. Order (*Author*).

1. Defin. — *An eruption of one or more crops of small, yellow, itching pustules, disseminated or collected in clusters, the contents of which dry up in a short time, and assume the form of yellowish, rough, or prominent incrustations; generally unaccompanied by fever, and not contagious.*

2. I. Description. — Impetigo may attack every part of the body. It may be simple or complicated. Willan, Bateman, and Biett enumerate five species of the disease. I agree, however, with Dr. A. T. Thomson, in limiting them to two; three of those proposed by Willan being merely varieties of simple impetigo. The first species, or simple impetigo, according to this view, is unattended with fever, and comprises the figured, scattered, and scabid varieties. The second, or complicated, or erysepelatous species is attended with fever, owing, probably, to the extension of the inflammatory action to the more deeply seated integumental tissues.

3. i. *Simple Impetigo* — *Impetigo simplex* — usually occurs without any premonitory symptoms or derangement of health. It is met with most frequently in children at the period of dentition, in young persons of either sex, and in those of a sanguineous and lymphatic temperament, with a fine susceptible skin and florid complexion. It most commonly appears in the spring, at which season several have been periodically attacked by it during many successive years. This species occurs principally under two varieties. The pustules may be collected in circular or oval groups, occupying a surface of greater or less extent, but pretty exactly circumscribed: this variety constitutes the *Impetigo figurata* of Willan. Or the pustules may be scattered far apart, assuming no particular form, but disseminated over a surface of variable extent: this variety has been called *Impetigo sparsa*. To these a third division has been added, by the name of *Impetigo scabida*, but this is merely a more severe form of *impetigo sparsa*. Many intermediate degrees exist between these varieties; but the characters they present are

sufficiently distinct to give scope to the general study of the disease. At the same time each variety may be acute or chronic, according as it consists of a single crop, or of successive eruptions, of pustules.

4. *A. Impetigo figurata — Dartre crustacée flavescente* of M. Alibert — is the most common of these affections. It may occur in any part of the body, — on the neck, trunk, and extremities, particularly the hands; but it generally occupies the face, appearing most frequently on the middle of the cheeks, from whence it extends, in a circular or oval direction, over a considerable extent of surface. Sometimes it is confined to the eyelids, when it is commonly complicated with ophthalmia; and occasionally it appears on the chin, the ala nasi, and immediately below the margin of the septum of the nose. Although this variety usually occurs without very manifest disease of the general system, yet it not unfrequently follows anxiety or other depressing affections of the mind. In this case it is ushered in by a feeling of lassitude, by disorder of the digestive functions, by weakness and uneasiness, accompanied by pain in the epigastric region, and sometimes by cephalalgia. The eruption, as it first appears on the face, commences by one or more small, red, and very superficial blotches, which itch considerably, and gradually enlarge, becoming covered with small, yellowish, psydracious pustules, placed so close to each other as to be almost confluent, and surrounded by a red inflamed border. The pustules are but slightly elevated, and are the seat and source of much heat and stinging pain. These clusters, which are usually of a circular or oval form, and of various dimensions, may continue isolated, or extend still further by the development of fresh pustules at their circumference; and the eruption may be so extensive, that both cheeks, and even the whole chin, may be covered with it at once. The pustules, however, do not remain long in this state; but in the course of thirty-six or forty-eight hours, or at most three days, they burst, and discharge an ichorous fluid, which dries quickly and is converted into a yellowish crust of greater or less thickness, very friable, slightly furrowed, semitransparent, and resembling portions of candied honey, or the concrete gummy exudations on a cherry-tree. At the same time the discharge continues under these crusts, thereby increasing their thickness, and causing them to extend considerably beyond the limits of the original pustules; and it is usually at this stage of the disease that the patient is seen by the practitioner. The skin in the circumference of these incrustations is of a red colour; and if the scabs fall or are rubbed off, the integuments under them appear likewise red and excoriated, exhibiting at the same time minute pores, from which a purulent discharge exudes, which greatly augments the heat and smarting. Towards the edges of these diseased patches may be still seen some unbroken psydracious pustules, and others over which the liquid has flowed when it is scarcely coagulated. If the disease be of great extent, the features can hardly be recognised.

5. *Impetigo figurata* continues in its crustaceous state from two to four weeks, when it is not protracted by successive eruptions: the itching and heat then abate, as well as the morbid secretion; the incrustations become drier, and fall off irregularly, leaving one or more red spots or marks, which remain visible for more than a month. The cuticle at the same time is so thin, as to be liable to excoriation from the slightest friction, and a very trifling exciting cause often brings back the disease. More frequently, however, the ichorous discharge is reproduced, accompanied with fresh crops of psydracious pustules; the eruption is repeatedly renewed after running its usual course, and thus continues for many months, sometimes for years. In this manner it becomes a chronic disease, although the successive inflammations keep it always in an active state. In these cases the inflammation does not spread superficially, but penetrates the whole thickness of the skin, and sometimes affects the subcutaneous cellular tissue. When the disease yields either spontaneously, or to medical treatment, the amendment commences in the centre of the patches; and even when this occurs, not infrequently the edges retain their diseased character, and fresh pustules are produced: these, however, as the treatment proves successful, also gradually disappear; and the skin regains its natural colour slowly in these parts.

6. *Impetigo figurata* may appear on the limbs; and even on the body. When it affects the lower extremities, the patches are usually large, and of an irregular oval, whereas they are smaller and rounder on the upper limbs. Sometimes the patches enlarge by successive marginal crops: this has been observed on the legs, which have thus been gradually covered from above the knee to the ankle. The disease often becomes chronic, and the time of its duration varies. In such cases, we do not observe successive and abundant crops of pustules, or these large inflamed patches, but merely a few occasionally. Frequently, however, no pustules are found; but the peculiar form of the patches and crusts, with the partial eruption from time to time, suffice to characterise it. In some instances the pustules are intermixed with transparent vesicles, as in some of the varieties of *herpes*. When this intermixture occurs, the disease is much more troublesome from the extreme irritation, itching, smarting, and heat, which accompany it, and is much more difficult of cure. When these vesicles break, they discharge a fluid much more acrimonious than that of the pustules, which, wherever it touches the sound skin, produces a vesicular inflammation and a pustular eruption. This variety of the affection appears principally on the hand, about the metacarpal bones, or on the wrist. The vesicles appear in slow succession at a little distance from each other and from the pustules; when broken, they are little disposed to heal; and the cuticle ultimately becomes thickened and inflamed, and covered with the rising eruptions, small humid ulcers, and chaps or fissures. The sensation of burning and intense itching is extremely distressing, especially on the first rising of the vesicles; and every remedial application, which is employed, becomes a source of irritation, and increases the evil.

7. *B. Impetigo sparsa* differs from the preceding variety merely in the irregular and scattered distribution of the eruption. Its nature and progress are the same; but, instead of being arranged in circumscribed groups, its pustules are dispersed without any regular order over the extremities,

neck, face, shoulders, and external ears. This variety is most prevalent in autumn, continuing obstinately throughout the winter, and disappearing only at the approach of summer. It has a greater tendency to pass into the chronic state than the last variety. Although it may develop itself on any part of the body, yet it affects more particularly the extremities, manifesting an especial predilection for the legs, and in that situation becoming extremely troublesome and obstinate. Sometimes it confines itself to one spot alone; at others, it covers a whole limb, or even more than one at the same time.

8. The pustules in *impetigo sparsa* are developed in the same manner as in *impetigo figurata;* but here, instead of being collected together, they are scattered irregularly over the diseased surface, and accompanied with insupportable itching. The incrustations also, which follow the bursting of the pustules, are thicker and more friable, and not formed into so large plates as in *impetigo figurata:* the attendant inflammation is, however, more extensive; and as they fall off and disappear, the surface of the limb becomes studded with ulcerations and fissures. Œdema is not an infrequent attendant or consequence of this variety of the disease.

9. In some cases, and especially in persons of advanced age, with enfeebled constitutions, the crusts attain a great thickness: they are of a yellowish brown colour, variously divided by deep fissures. They have been compared to the bark of a tree by Willan, who calls this variety *Impetigo scabida.* It is, however, nothing more than a severer form of the last variety. Sometimes these crusts cover a whole limb, till it is cased with them, the motion of it becoming both difficult and painful; at the same time considerable heat and a tormenting itching exist. After a while, these crusts split; and, when a portion of them is detached, a copious discharge exudes from the excoriated surface, quickly concretes, and fills up the vacuity. When this variety affects the lower extremities, and is very severe, it sometimes occasions œdematous infiltration and ulceration, and even extends to the toes and secreting matrices of the nails — *Onychia Impetiginodes.* The œdema and ulceration commonly appear about the ankles, particularly in aged, weakly, or broken-down constitutions. The ulcers are uneven; and either discharge a sero-purulent fluid, or are covered by yellowish crusts; their edges being irregular, purplish, or livid, and often crowned with small sanguineolent pustules. When this variety occurs in the upper extremities, it does not differ from that already described, but it is much less severe, and its chronic form more rarely associated with œdema and ulceration, than that observed in the lower extremities. Acute *impetigo sparsa* of the face usually presents greenish yellow incrustations, dispersed over the cheeks or adhering to the beard in the adult. In children, the inflammation often extends to the nose, which swells, and is sometimes plugged up; the disease then frequently becoming chronic.

10. *C. Impetigo Favosa.*—This variety is merely impetigo sparsa affecting the *neck, ears,* and *hairy scalp* — the *Porrigo favosa* of Willan, and *Tinea granulata* of Alibert — especially of children, and occasionally of adults. It occurs most frequently in the back parts of the head, but the entire scalp may be implicated; and it appears as yellowish white pustules, irregularly scattered over the hairy scalp, and attended by inflammation and pruritus, their centres being traversed by hairs. In from two to four days, the pustules pour out a fluid, which agglutinates the hair, and dries into small brownish or greyish, rough, and irregular crusts or masses like candied sugar. These become friable and detached from the surface, but adhere to the hair, which often seems filled with them; a faint, sickly, or unpleasant smell being exhaled from the head, when cleanliness is neglected. *Pediculi* multiply rapidly, and swarm in the hair, which is not lost, but is often agglutinated or matted by the discharge.—Impetigo of the hairy scalp is not contagious, and does not implicate the piliferous bulbs, like *favus* or true *porrigo.* It seldom lasts longer than some months; and it commonly is removed in the course of a few weeks, with proper treatment. When it becomes chronic, the inflammation often extends to the cellular tissue underneath, giving rise to small circumscribed abscesses. The lymphatic glands of the neck are frequently enlarged and painful.—Rayer and Green consider that this affection of the scalp is strictly a form of *Impetigo sparsa,* and not a variety of the disease, to which Willan has applied the term *Porrigo;* and I am of the same opinion.

11. ii. *Complicated Impetigo.* — *A. Impetigo Eczematosa.* — Impetigo is sometimes associated with *Eczema*—*Eczema Impetiginodes.* (See art. Eczema, § 5.) The eruption so frequent in infants during suckling and teething, commonly called *Crusta Lactea,* or *Milk Scall,* is evidently an association of this kind, chiefly affecting the face, and extending partially to the scalp; the characters of eczema predominating in some infants, and those of impetigo in others. Occasionally it assumes nearly the appearance of impetigo figurata. It has been variously arranged by writers on diseases of the skin, who have, even to the present day, been more desirous to point out, and even to feign, distinctions, than to trace the changes which these diseases undergo, and the connections which subsist between them, or to show how frequently the one runs into the other; and has been termed *Impetigo larvalis, Impetigo mucosa, Tinea lactea* (Sauvages), *Tinea benigna, Tinea muciflua* (Alibert), *Porrigo lactea, Porrigo larvalis* (Willan, Bateman), *Lactumen, Eczema lactea,* &c., according as it was supposed to be allied to *Impetigo, Porrigo,* or *Eczema.* This of itself is sufficient to show the very intimate relation of these affections to each other, and to point out the necessity of considering them in their natural conditions, and in connection with their particular seats, and with the states of vital action; and not merely with reference to certain artificial distinctions, which often cannot be ascertained, and which sometimes do not exist. The differences between *vesicles* and *pustules,* so much insisted on in the classifications usually adopted at the present time, often do not exist, or exist not in such a manner as to become available to the practitioner. These, and numerous others, so implicitly received as matters of belief, may be useful, as a part of the craft of the adept; but they are of very minor importance in the estimation of the truly philosophic observer, and are valued by him for just as much as they may be worth, in the particular cases in which

they are manifest. An eruption may be vesicular to-day, and pustular to-morrow; or, in other words, the former, owing to changes in the vital actions of the part affected, and in the morbid secretion, may pass into the latter; or both kinds of eruption may be coexistent or coëtaneous, either in the same, or in different, situations of the same case. Instances will also occur, in which the most acute observers will be puzzled to determine whether the primary eruption is vesicular or pustular; for it may be intermediate as respects the appearances both of the contained fluid, and of the containing and surrounding tissues. To whatever genus this eruption may be referred, — whether it be dignified in being described as a genus of itself, or be viewed as merely a species, or be debased to the rank merely of a mongrel variety, — it is consolatory to know, that, in its intenser states and more extended forms, as well as in slighter grades, and however great the attendant pruritus and pain may be, or however deep the chaps or fissures may seem, no permanent marks or cicatrices are produced by them.

12. *B. Impetigo Erysipelatodes* is easily distinguished, by presenting, at its commencement, the ordinary symptoms of erysipelas. The other varieties of the eruption are in general unattended by any febrile disturbance, although the digestive organs may be more or less disordered. But this is ushered in by decided symptoms of constitutional commotion. Its premonitory stage is characterised by perturbation of the system, fever, much burning and smarting heat, an œdematous state of the eyelids, and a redness and puffy swelling on the upper part of the face. This state of things continues for two or three days; when, on running the finger over it, the surface, instead of the smoothness of erysipelas, is found to exhibit a slight inequality; and on minute examination it seems papular. In a day or two more it is covered with numerous psydracious pustules, which first appear below the eyes, but soon cover the greater part of the face, and sometimes extend to the neck and breast. The itching, smarting, and sense of heat, which accompany these pustules, are very distressing. When they break, a hot acrid fluid exudes, which irritates, and often excoriates, the sound surface on which it flows. The face remains in this painful condition for ten or fourteen days, when the discharge diminishes, and concretes into thin yellowish scabs, in the interstices between which, fresh pustules arise at intervals with renewed heat and pain, and run the same course as the former. The disease may continue thus severe and troublesome for two or three months. The period of its duration, however, is uncertain; and when it disappears, it leaves the cuticle in the same dry, red, and brittle state, which characterises the departure of the other varieties of impetigo. During the progress of this disease, the health of the patient is not very much disordered, and the constitutional disturbance is much less than in erysipelas. This form of the disease is occasionally confounded with *eczema impetiginodes*. In the advanced stage, however, the distinction is easily recognised.

13. Besides the above varieties of *impetigo*, Willan and Bateman mention another, under the title of *Impetigo rodens*. It is, however, of very rare occurrence, and cannot with propriety be called an impetiginous disease, being more of a malignant ulcer, complicated with psydracia. It is said to be uniformly fatal, and to have been benefited by no remedies, either external or internal, which have been employed for its relief.

14. II. Diagnosis. — The varieties of impetigo are liable to be confounded with other pustular eruptions, especially *porrigo*, *ecthyma*, and *scabies*, and with *eczema*; but a careful inspection of the pustules and of the incrustations, as either may present themselves, will show the differences between them. — *a.* The clusters of *impetigo* are distinguished from the circles of *porrigo*, in not continuing to pour forth a purulent and glutinous discharge, but, after the first eruption, an ichorous humour; and in not forming those thick soft and copious scabs, which characterise the latter disease. The pustules of impetigo discharge, while those of porrigo, seated more deeply, are quickly changed into dry, yellowish-coloured, cup-shaped scabs. The crusts of the former are brown, or of a dull grey, and not broad, thick, nor continuous, as in *porrigo scutulata*. Impetigo of the hairy scalp is not likely to be mistaken for *porrigo lupinosa*; it does not implicate the piliferous bulbs, like this and the other varieties of porrigo. It is distinguished, however, with greater difficulty from *eczema impetiginodes* affecting this part, the principal difference being in the appearance of the incrustations; but, as already insisted on, these latter are very nearly related eruptions. — *b.* The diagnosis between *impetigo* and *scabies* depends on the distribution of the eruption in patches; the copious exudation of ichor; and the reddened, rough, and fissured cuticle; and the heat and smarting, which accompany the itching, in the former. In the strictly purulent scabies, the pustules rise to a much greater elevation and magnitude, than in this complaint, and are filled with a thick, yellow pus, and are more inflamed around their base. Porrigo and scabies are contagious; but none of the varieties of impetigo possesses this property. — *c.* In its more advanced stage, impetigo may be mistaken for *psoriasis* or *lepra*; but, in these, there are no laminated concretions of ichorous matter or lymph, the squamæ consisting of exfoliations of morbid cuticle. These scaly diseases emit no fluid; and the existence of pustules and of a discharge, however slight, are sufficient to determine the impetiginous eruption. — *d.* The pustules of *psycosis* are larger, and not so yellow, and are more isolated and more prominent, than those of impetigo; which are always much crowded, and secrete abundantly. The scabs of the former are drier and of a deeper colour than the crusts of the latter; and are reproduced only after a fresh eruption of pustules. The crusts in impetigo are greenish yellow, thick, semitransparent and reproduced without any renewal of the pustules. In psycosis, also, the pustules do not break till the fifth, sixth, or seventh day; whilst in impetigo they burst on the third or fourth. Moreover, tubercles and indurations are observed in the former, but not in the latter. — *e.* Impetigo is more likely to be confounded with *syphilitic eruptions* on the face; but the peculiar character of venereal desquamations, or the firmly adherent scabs, concealing ulcers and leaving indelible cicatrices, sufficiently distinguish the latter from the former. Some of the forms of eczema may be mistaken for impetigo, but the diagnosis has been fully stated in the article Eczema (§ 13.). The

most superficial observation will detect the very marked difference between *acne rosacea* and this complaint. Mr. Dendy states that the internal use of the deuto-ioduret of mercury often produces vesicles, followed by yellow or yellowish green scaly crusts, which may be easily mistaken for those of impetigo and porrigo.

15. III. Prognosis.—This is more favourable in impetigo than in *lichen, lepra, psoriasis, eczema*, and many other cutaneous eruptions. In whatever part of the body the disease, in its *acute state*, be situated, it generally yields to medicine in two or three weeks. Its duration in the *chronic form* cannot be stated with precision; as this necessarily depends on the constitution of the individual, the number of the eruptions, and the existence of other particular conditions, such as scrofula, pregnancy, amenorrhœa, the change of life, &c. When chronic impetigo occurs on the head, on the upper lip, or any other region covered with hair, it often proves a very obstinate and troublesome disorder; especially if the patient be of advanced age, of a scrofulous diathesis, or a shattered constitution. But, under no circumstances, can it be regarded as attended by danger. The sudden suppression of the more severe forms of the eruption, particularly those affecting the face and scalp of children, may, however, be productive of most serious disease.

16. IV. Causes. — Impetigo is not communicated by infection. It is most frequently observed among the poor, ill-lodged, badly fed, and filthily disposed classes. Its exciting causes are, however, sometimes obscure. Individuals of a sanguineous or sanguineo-melancholic or lymphatic temperament, and scrofulous constitution, with a thin, soft skin, are most liable to it. In them it is occasionally excited by violent exercise, by intemperance of any kind, or by the depressing passions of the mind, as grief, disappointment, fear, &c. It is very often preceded by headach, languor, and disorder of the alimentary canal, and cannot be traced to any other exciting cause than this disorder. — Infants at the breast, and children during teething, particularly the lymphatic and scrofulous, are most liable to the varieties affecting the face and scalp. Young persons with fine skins are sometimes attacked with that of the face, on exposure to a hot sun. Females, on the apppearance, and on the cessation, of the catamenia, are also apt to be affected with this complaint. Several external causes may, however, excite pustules of impetigo, by acting directly on the skin. Persons who handle irritating substances, as raw sugar, lime, or metallic dust, often have impetiginous eruptions on the hands. Bateman regards the pustules, caused by the ointment of tartarised antimony, as a species of this disease; but they are of an entirely different character, and cannot be classed among any of its varieties. I believe, that disorder of the digestive organs, and accumulations of mucous sordes and other secretions in the *prima via*, more commonly occasion impetigo than is generally supposed. I scarcely have seen a case, in which this derangement was not manifest either before, or in the course of, treatment; and in which this eruption was not evidently symptomatic of it. In this opinion I am supported by Mr. Dendy, my late colleague at the Infirmary for Children, where cases of this kind came frequently before us.

17. V. Treatment. — i. Whatever be the variety of simple impetigo, one mode of treatment is indicated. In the commencement of the disease, Willan and Bateman recommend the internal administration of *sulphur*, but not in sufficient quantity to produce purging; and if there is much inflammatory irritation of the cuticle, *soda, nitre*, or the *bitartrate* of *potash*, with which some of the *vegetable acids*, as *citric acid*, or *lime juice*, may be advantageously combined. The indiscriminate employment of sulphur has, however, sometimes aggravated the symptoms, and favoured the re-appearance of the eruption. I have prescribed, with marked benefit, the *sub-borate of soda* in emollient vehicles, either with or without small doses of nitre, or of the bitartrate of potash. — *Bloodlettings*, either general or local, have been proposed in extensive attacks of *impetigo figurata*, and in plethoric individuals may be of advantage; but, in general, they are not productive of benefit, and in persons of a weak and scrofulous habit of body are detrimental. If the eruption is attended by much fever, *calomel* and *antimonials*, or other mild mercurials, cooling *saline solutions*, and *diaphoretics* with *diuretics*, will be of service.

18. Locally, emollient fomentations, such as the decoction of mallows, digitalis, poppy heads, &c., and ablution with tepid water, are of the most essential service in the incipient stage of this disease, especially of the common saline mixture, with conium, be given at the same time. At a later period, saturnine or alkaline lotions, and the application of the ointment of the *acetate of lead* or *oxide of zinc*, will accelerate the cure, and will be often sufficient to effect it.

19. ii. When this affection occurs in children at the period of dentition, simple cleanliness is frequently all that is required. Here the eruption is occasionally accompanied by a manifest improvement in the constitution, and it would be highly imprudent, and even injurious, to check or repel it. If it occurs on the hairy scalp or face (§ 10.), the hair must be removed, and emollient applications resorted to. Where there is much local inflammation, or in plethoric children, *leeches* ought to be applied behind the ears. *Saline purgatives*, as the sulphate of soda, sulphate of magnesia, or tartrate of potash and soda, may be given with advantage in these cases, in doses of from two drachms to half an ounce daily.— If the disease, wherever occurring, proves obstinate, it has been usually treated by an alterative mercurial course, particularly *Plummer's pill*, or the *hydrargyrum cum cretâ*, with the decoction of *sarsaparilla* or *cinchona*; but a more beneficial effect has been derived from the exhibition of fine or six grains of *calomel* at bedtime, followed by a brisk *cathartic* the next morning, and a moderate dose of the *liquor arsenicalis*, taken three times a day, in the decoction of *elm bark*.

20. iii. As to *local means*, almost every variety has been tried in this disease. In some instances the patient cannot bear the most soothing and emollient applications; while, in others, the most stimulant have been employed with advantage. Where the irritation is insupportable, the use of the *hydrocyanic acid* has been suggested by Dr. A. T. Thomson, in the proportion of one fluid-drachm to four fluid-ounces of water, combined with one drachm of *alcohol*, and six or eight grains of *acetate of lead*; and subsequent expe-

rience has shown the value of this application. It sooths the irritation, and disposes the skin to regain its healthy action: but it must not be applied without caution; as cases have been recorded, where it became absorbed into the system, and produced depressing effects on the constitution, with considerable intermission of the pulse. These unpleasant symptoms, however, ceased on discontinuing it. It is useless to apply any local remedies, until the thick incrustations, which occur in *impetigo scabida*, are removed by emollient poultices, or by a weak decoction of poppies, or by exposing the surfaces to the vapour of hot water, &c. Any of the mild ointments before mentioned may afterwards be applied, and the surface should be covered with pledgets of soft lint, or the whole should be touched with a solution of *nitrate of silver*; or, if the skin is not very irritable, and the attendant inflammation but slight, while at the same time the disease has become chronic, the baths of Harrowgate, or artifical *fumigations of sulphur*, the hot air and *vapour baths*, and the *alkaline* and *sulphureo-gelatinous baths* will frequently both procure the removal, and prevent the recurrence, of the eruption. But in the more inflammatory cases, and in plethoric persons, bloodletting should precede a course of these baths. With the same intention, the baths of Barèges, Loüesche, Cauterets, Enghien, and many other Continental springs, have been recommended. Great benefit has also been derived from the warm sea-water bath, especially when followed by a course of sea bathing; it should, however, be remembered that salt water is injurious during any actual inflammation. But great discrimination is always required in the treatment of this eruption. Where there are much inflammation and irritability of surface, the internal remedies should be of a cooling and sedative nature; and the external applications, emollient and palliative; — in an opposite state, the *arsenical solution* may be given; and slightly stimulant ointments, such as the ointment of nitrate of mercury diluted with six or seven parts of simple ointment, or an ointment of trisnitrate of bismuth, may be applied. — In all cases, the *diet* of the patient should be restricted, and animal food taken in very moderate quantity: milk and farinaceous food are the most appropriate. Fermented liquors, spirits, and wine, ought to be strictly forbidden.

21. iv. In *impetigo erysipelatodes*, antiphlogistic means must be early adopted. *Purgative medicines*, especially the infusion of senna with full doses of the alkaline carbonates, and the *neutral salts* with *antimonials* and *nitre*, will materially alleviate the fever; but when the discharge is copious, and incrustations begin to be formed, the greatest benefit will be derived from the *decoction of cinchona* with *hydrochloric*, or dilute *sulphuric acid*.— If the disease becomes chronic, a slight alterative course of *mercury* and of *sarsaparilla* generally proves beneficial. The *solution of potash* and the *alkaline carbonates* are also serviceable, when taken in tonic infusions. The *local remedies*, which were recommended in the other forms of the disease, namely, emollient fomentations and tepid ablutions, mild ointments applied to the excoriated surfaces, and sea bathing, or sulphureous fumigation on the decline of the eruption, will also be required in this variety.

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IMPOTENCE AND STERILITY. — Syn. *Impotentia Generandi, Sterilitas*; ʼΑναφροδισια, *Anaphrodisia* (from α, neg., and ἀφροδισια, and that from ʼΑφροδιτη, Venus), Auct. var. *Impuissance*, Fr. *Unvermögen zum Beyschlaf, Ohnmächtigheit*, Germ. *Impotenza*, Ital.

Classif. — 4. *Class*; 1. *Order* (*Cullen*). 5. *Class*; 2. *Order* (*Good*). I. Class, II. Order (*Author*).

1. Defin. — *Incapacity of sexual intercourse, and inability of procreation.*

2. *Impotence* and *Sterility* are so intimately related, that they must necessarily be considered under one head, although disjoined by Good and some other nosologists. They are subjects of much greater practical importance than has been conceived by many, and often involve the happiness and perpetuation of families. Yet have they, by a sort of professional prudery, been either entirely overlooked by medical writers, or very imperfectly discussed, and thereby relinquished to the irregular practitioner, or to the entirely unqualified empiric. In the present æra of high refinement, and of luxurious, if not vicious, enjoyments; and under the influence of noxious plans and systems of education; instances are very numerous, for which medical advice is required for the removal of the morbidly disqualifying conditions about to be considered, but is not resorted to so frequently as it ought to be. Since advice is thus often necessary, the ability of those, from whom the community have a right to expect it of the most judicious kind, should be equally great in providing it. There is every reason, also, to believe, that it would be oftener sought after, if the subject were known to be more fully entertained by the duly qualified members of the profession. The practical consideration only of these morbid conditions falls within my plan: their legal relations are very ably discussed in the classical works of Paris, Beck, and Smith.

3. *Impotence* may exist in either sex, but most commonly in the male, owing to the sexual conformation. *Sterility* most frequently depends upon the female, although it sometimes is owing to the male; and, in a practical point of view, if not in a medico-legal one, it is more frequently thus owing, than is stated in books.

4. *Impotence* and *Sterility*, in respect of both sexes, have been differently arranged by writers; — into *absolute* and *relative*; *constitutional* and *local*; *direct* and *indirect*; *permanent* and *temporary*; and, by Dr. Beck, into *absolute, curable*, and *accidental*. These distinctions are all of importance in the consideration of the subject; but the divisions founded on the nature of the causes are more useful. — M. Raige Delorme has ar-

ranged impotence into — 1. that depending upon lesions of the sexual organs; — 2. that proceeding from disorder or interruption of seminal emission; — and, 3. that caused by defect of the faculty of erection. The division adopted by Dr. Beatty, into — 1. Organic; — 2. Functional; — and, 3. Moral; — although not materially different from the foregoing, is preferable to it. — I shall consider the subject with reference — *first*, to the male, and, *secondly*, to the female; and view in succession the *mental*, the *functional*, and the *organic* states, from which impotence and sterility most frequently proceed.

5. I. Impotence in the Male — *Agonia*, *Agenesia*, *Impotentia Generandi Masculina*, *Sterilitas Paterna*, *Dyspermatismus*, *Dyspermasia*, Auct. var. — *Male Sterility* — may depend upon — 1. Mental influences or causes; — 2. Functional disorder; — and, 3. Organic lesions of the sexual organs. — 1st. *Mental influences or causes* may occasion *temporary*, or more or less *prolonged*, *impotence*, even in persons of a sound constitution in every respect. In them, the removal of the cause leaves the generative organs in a condition capable of performing their functions. The moral or mental influences, which most frequently occasion impotence, are, chiefly, too eager, too violent, or over-excited desire, affections of the imagination, and the depressing passions. Fear of incapacity, or of not being loved, timidity, shame, disgust, hatred, jealousy, surprise, terror, or any of the more violent mental emotions, most commonly have this effect. The first of these causes is, however, the most frequent; and the second, — the influence of the imagination, — the most powerful and permanent. In former times, when superstition, and a belief in the power of magicians, of incantations, of sorcery and witchcraft, prevailed, the state of the imagination was often not only the cause, but also the cure, of this affection; and, whilst incantations and other modes of impressing the mind were resorted to, for the purpose of destroying sexual power, amulets and charms were worn, not only for the purpose of guarding against their effects, but also for the restoration of this power, when lost or impaired. In the East and in Egypt, in Greece and in Rome, in uncivilised countries and in the seats of civilisation, until a belief in witchcraft ceased, these means were daily resorted to, as well as others, which could operate only through the medium of the imagination. The bane and the antidote were both confided in, however obscure, or impenetrable, or even absurd, either of them might have been. Montaigne was the first to penetrate and to expose the mystery of their operation. The twentieth chapter of the first book of his *Essays* will be read both with interest and instruction; and the thirty-seventh chapter of the second book will be found not less profitable to the practitioner of the present day.

6. 2d. *The generative function may be variously impaired*, and by diversified causes. — M. Virey remarks, with his accustomed desire of effect rather than of accuracy, that "the genital organs offer two states during life in the young and old, which are the frozen zones of existence, the intermediate period being the torrid zone of life. The child has nothing to give, the old has lost all." Instances, however, occasionally occur of genital precocity; and those in which the function continues till a late period of life, are by no means infrequent. The generative function appears with puberty, and continues until the sixty-fifth year, or even much later, unless impaired by excesses, or by local or constitutional disease. During, however, this long period, numerous circumstances tend to weaken or permanently to destroy it. The constitution and energy of the parents are sometimes the cause of the imbecility of the offspring. Children from premature connection, or of exhausted, aged, or worn-out persons, often inherit the incapacity of their parents, in respect both of the function in question, and of the system generally. Those, who are thus *hereditarily* or *constitutionally* impotent, are of a leucophlegmatic or lymphatic temperament; their soft solids, especially the fibrous and muscular structures, are soft, lax, and weak; their forms are rounded, from the superabundance of cellular and adipose substance; their hair is soft and fine, and deficient on the face and pubes; their frames are delicate and feminine; their voices are shrill, clear, sharp, or weak; and their testes are small and soft, the cords and scrotum being soft, lax, and pendulous.

7. Functional impotence is most commonly caused by premature or excessive venereal indulgences, and especially by the pernicious crime of manustrupatio. By these most injurious habits, the organs are excited to action before they are fully developed, and the seminal fluid excreted before it is duly elaborated. The muscles concerned in the generative function, and those also of the lower extremities, are either imperfectly formed, or have their energy remarkably impaired, so that they become susceptible, vacillating, and ultimately nearly paralysed. The imagination is morbidly acute or excitable, and erection imperfect, or frequent and momentary. The seminal and prostatic secretions are consequently weak, thin, clear, scanty, and serous; the whole frame, and particularly the nervous system, languish, and become enfeebled by the too frequent discharge of a fluid essentially vital, partly recrementitious, and necessary to their support; and ultimately the testes emaciate, or become soft. The variety of impotence noticed by Dr. Paris, depending upon a want of consent between the male organs of generation; or that in which erection takes place without discharge, or in which this latter occurs too quickly, and after imperfect erection; is most commonly the consequence of the causes just mentioned. But, in such, the evacuation consists chiefly of the prostatic fluid. General debility, from imperfect or unwholesome nourishment, may weaken the procreative energy, or render the desire less frequent, but it rarely destroys it altogether, or even for a time. Severe diseases, intense application to study, or to abstract inquiries or pursuits, have a still more remarkable effect in impairing, or temporarily destroying, the generative functions. In some instances, prolonged disuse of this function is followed by wasting of the testes, and, consequently, permanent impotence is the result. These organs, like others of the œconomy, are strengthened by moderate use, are weakened by abuse; their functions being often entirely lost by protracted disuse.

8. There are various other causes which may occasion functional impotence, particularly in certain constitutions; as the use of narcotics, espe-

cially of tobacco, hyoscyamus (MARC), cicuta, and opium. The sedative gases (FODERÉ), particularly carbonic acid gas, may produce it. Various refrigerants have a similar influence, as nitre, the carbonates of soda, camphor (DIEMERBROECK and LOSSIUS), and some cooling diuretics. The smell of camphor has long been considered as anaphrodisiac; and colchicum has certainly this effect, as noticed by DR. BEATTY. Soda water also exerts the same influence. The effect of these, however, are only temporary or partial. — Injuries of the spine or spinal cord, or of the head, particularly the occiput (MARCELLUS DONATUS, FABRICIUS HILDANUS, HENNEN); venæsection behind the ears (HIPPOCRATES); arteriotomy, &c.; have been considered causes of impotency. Of the influence of the first of these there can be no doubt. The use of mercury has been assigned as a cause; but it can hardly be viewed as such, unless carried to excess.

9. 3d. *Organic lesions* occasioning impotency, are — (*a*) Diseases of the generative organs or of adjoining parts; — (*b*) Malformations of these organs; — and (*c*) Deficiency of one or more of them. — Anaphrodisia from the *first* of these is often only temporary or relative; but from the *second* and *third*, it is generally absolute and permanent. *A*. The *diseases* which most frequently cause impotency are — *firstly*, those of the penis; *secondly*, of the testes; and, *thirdly*, of adjoining parts. *a*. The *penis* may be so excessively irritated as to occasion a temporary impotence by obstructing the opening of the seminal ducts and the urethra. Much more frequently, however, complete or partial paralysis, or deficient energy of the nerves, and consequently of the muscular and vascular action of the organ, occurs, constituting the *anaphrodisia paralytica* of authors. This latter state is merely an aggravated form of functional impotence, and most commonly produced as above stated. A singular instance in which the cells of the corpora cavernosa were apparently disorganised or altered by inflammation and suppuration, so as to prevent the influx of blood, and consequent distention of the penis, and to occasion impotence, has been recorded by MR. CALLAWAY. A similar change to this may take place in one side of the organ, and have nearly the same effect upon its functions.

10. Various obstructions to the seminal discharge occasion temporary or permanent impotency. The chief of these are strictures of the urethra, and disease of the seminal ducts. FODERÉ (*Med. Leg.* lib. i. p. 382.) adduces two cases, in which the powers of copulation existed, but without the seminal discharge. In one, the ducts were obstructed by hard concretions; in the other, they were constricted and callous. As stated by DR. BEATTY, the opening of the conjoined ducts of the vasicules seminales and vasa deferentia may be closed by scirrhous enlargement of the neck of the bladder, by enlargement of the prostate gland, by scirrhosity of the verumontanum, or by lesions of the duct itself. Strictures of the urethra can hardly be considered a cause of impotency, unless they are so extreme as not to permit the passage of a fine bougie. In the states of disease just mentioned, the inability of procreation arises from obstruction to the discharge of the seminal fluid, which is duly secreted; and when the obstruction is seated in the urethra, it may be removed by modern surgery. M. FODERÉ and DR. DUNLOP state that double scrotal hernia, by pressing upon the spermatic cords, sometimes causes as complete emasculation, as if the testes were entirely removed.

11. *b*. Impotency may also depend upon organic *lesions of the testes* — upon scirrhus, carcinoma, fungoid disease, or scrophula of these organs. But unless the whole structure of both organs be changed, the faculty of procreation may not be entirely or permanently lost. Uncommon smallness of these organs may occasion only temporary impotency; for this state may depend upon delayed evolution, or arise from the wasting consequent upon disuse. MR. WILSON mentions the case of a person, twenty-six years of age, in whom the penis and testes remained of the same size as in childhood. He married at this age, and at twenty-eight, the organs had reached their natural size. When, with smallness, there are remarkable flaccidity and softness conjoined, impotency is much more complete and even permanent. In a case of this kind in a strong young man, sometime under my care, no benefit resulted from treatment. Severe *bruises* of the testes may be followed by wasting or disorganisation of them. DR. J. G. SMITH alludes to this mode of making eunuchs, and states that it sometimes failed. I believe that most of the instances in which impotency has been said to have been produced by riding, have been owing to bruises or injury of these organs, or to the pressure to which they have often been subjected. Wasting of the testes may, however, arise without any very obvious cause. In the extreme case in which I was consulted, I was unable to ascertain its source. It occurred in a most robust and muscular young man, who would not admit that he had ever had recourse to excessive or vicious indulgence, or that he had been unusually continent, until his inclination ceased with the decay of the organs. FODERÉ states that it was a common disease among the labourers in the canal at Arles; and LARREY, that it was not uncommon among the French troops on their return from Egypt. It has sometimes occurred as a consequence of the metastasis of *Cynanche parotidæa* to the testes. — *Induration* of these organs, independently of scirrhous disorganisation, may be so great as to destroy their functions. According to M. ANDRAL, the seminiferous tubes are entirely obliterated, and the structure of the organ is hard, homogeneous, and without trace of organisation in cases of extreme induration. Impotence from inflammation of the testes is only temporary.

12. *c*. The *lesions of adjoining parts* occasioning impotency, are chiefly, uncommon obesity, very large scrotal hernia, and hydrocele. Neither of them requires any mark. A varicose state of the spermatic veins may also have this effect, when it is very remarkable. But I am unacquainted with cases in which this cause has been assigned.

13. *B*. *Malformations of the male genitals* may occasion impotency. Great size of the penis is seldom, and smallness of the organ is, perhaps, never a cause of it, if the functions of the testes are duly performed. According to ZACCHIAS, FODERÉ, BEATTY, and others, excessive size, particularly excess in length, may produce relative or temporary impotence, by injuring the female organs. The chief malformations of the penis having this effect absolutely or permanently, are those in which the urethra terminates in the pe-

rineum; and even in these, impregnation may be accomplished by art. JOHN HUNTER was consulted in a case of this description, and was induced, by the experiments of SPALLANZANI, to recommend the patient to collect the seminal fluid emitted from the perineum during intercourse, and to inject it into the vagina. Impregnation took place, and a healthy child was born in nine months.

13. In cases where the urethra opens in a part of the penis admitting of being introduced within the vagina, impotency may exist, but it is only relative; for procreation may be effected when the opening is thus situated, whether it be on the dorsum (*epispadias*), or on the inferior surface (*hypospadias*), as more frequently observed. Numerous instances are recorded by SIMEONS, BELLOC, KOPP, BLUNDELL, and FODERÉ, of impregnation by persons in whom these malformations existed. Mr. J. HUNTER met with a case, in which the epididymis terminated in a cul-de-sac, instead of passing to a vas deferens. Dr. BEATTY states, that a similar conformation sometimes exists in the vesiculæ seminales, where, instead of entering the urethra, they terminate, after being joined by the vasa deferentia in shut sacs. When these formations of the excretory ducts of the testes exist on both sides, absolute impotency necessarily results, but they are extremely rare.

14. C. *Deficiency of one or more of the male organs* occasions absolute or relative impotency. *a.* Congenital deficiency of the *penis* is rarely observed, and complete deficiency, still more rarely. Mr. FODERÉ mentions a case in which no vestige of the organ existed from birth. The testes were perfect, and sexual desire was not impaired. In most of the instances of congenital partial deficiency or malformation of the *penis*, recorded by authors, the urinary organs presented other malformations, particularly in respect of the urinary bladder and ureters. This is illustrated by several cases in Dr. DUNCAN's Memoir on this subject. (*Edin. Med.* and *Surg. Jour.* vol. xxv. p. 31.). *Accidental* deficiency of the penis is sometimes met with. The organ may have been either amputated or destroyed by disease. Some years ago, a surgeon, a friend of the author, was sent for in great haste. He found a man in a state of syncope from hæmorrhage proceeding from a very recent amputation of the penis close to the pubis. The strictest secrecy was preserved as to the cause and mode of amputation, which had evidently been effected by a sharp instrument.

15. The glans penis, and indeed the greater part of the organ, may be lost without causing more than relative impotency; and possibly, nearly all of it may be removed without producing an absolute loss of the procreative faculty, if the means resorted to by JOHN HUNTER (§ 12.) be employed. Instances of extensive mutilation of this organ, without destroying this power, are referred to by FRANK, PARIS, BEATTY, and others; and although there is every reason to conclude that a complete removal of the penis will generally occasion impotency, yet the proper function of this part being to excite the female organs, and to convey the prolific fluid to the parts destined to receive it, if these purposes can be at all accomplished, impregnation may follow.

16. *b.* Congenital deficiency of the *testes* is rarely observed; and most of the cases in which these organs have been said to have been wanting, are merely instances of their retention in the abdomen. When they are not found in the scrotum, their entire absence can be inferred only from the history of the case, and from the state and appearances of the patient; for when they are altogether wanting, the usual characters of the male are partially lost, and those of the female assumed. As delay in the descent of the testes may arise from some imperfection, or delay of development, as J. HUNTER reasonably infers, certain of the female characters may be presented, and yet these organs may exist nevertheless. The question then is, whether or not, the state of development, to which they may have attained, is sufficient for procreation. M. MARC adduces the case of a person of a feminine appearance, who yet possessed the full procreative power. The external characters cannot therefore always be confided in; but when all the external appearances of virility are present, although the testes are not found in the scrotum, there is every reason to infer that impotency does not exist; for numerous instances are on record proving that the mere retention of these organs within the abdominal ring does not affect the procreative power.

17. The congenital absence, destruction, or removal, of one testis is not a cause of impotency. It may however be a cause of relative incompetency and even of complete impotence, if the remaining one be soft, small, or withered. Castration, or the removal of both testes is followed by complete and permanent impotence, if it have been performed before puberty. But, subsequently to this period, the power of procreation may exist for a very short time after its performance, owing to the seminal fluid collected in the vesiculæ seminales previously to the operation. M. MARC supposes that the time taken for the cure of the wound is sufficient for the absorption of this fluid into the circulation; but the cases adduced by M. BOYER and Sir A. COOPER prove that a temporary power exists or is retained until the vesiculæ seminales are emptied. On this subject, the works of PARIS and BECK will be consulted with advantage, for it hardly comes within the scope of this work.

18. II. IMPOTENCE AND STERILITY IN THE FEMALE. A female may be impotent but not sterile, and she may be sterile, but not impotent; for, as respects the former condition, a state of the sexual organs may exist sufficient to prevent intercourse, and yet, upon its removal, impregnation may take place; and, as regards the latter condition, perfect competency to intercourse may exist, and yet conception may never occur. She may also be both impotent and sterile, or, in other words, were the impediment to due intercourse entirely removed, impregnation might not be effected. Sterility is very much more common than impotency in the female, and even than impotency in the male.

19. *A. The causes of* IMPOTENCE *in the female* are an impervious state of the vagina, absence of this canal, remarkable constrictions of it, the division of it by a septum running downwards from a double uterus, adhesions of the sides of the vagina, or of the labia, and the termination of the passage abruptly in a cul-de-sac. An impervious vagina may arise from changes in the soft parts, consequent upon protracted inflammation or irritation, the passage becoming first constricted or remarkably contracted, and ultimately obliterated. In a case respecting which I was consulted, a recto-vaginal fistula, seated at the upper part of the va-

gina, had occasioned so remarkable a contraction of the vagina, that its canal was almost obliterated, its parietes having become callous and indurated. A similar result may also follow a vesico-vaginal fistula. FODERÉ believes, that malformations of the bones of the pelvis may be so great as to prevent intercourse, but this can hardly be the case. Exostoses, however, on the internal or inferior surface of the bones of the pubis may have this effect, but their occurrence in this situation, and to this extent, must be very rare. Congenital absence of the vagina has been met with by VILLAUME, MOULON, SYME, and WARREN; and absence of both vagina and uterus by MOTT, DAVIS, MACFARLANE, and others. In a case adduced by FODERÉ, the uterus and vagina were found, upon dissection, to constitute one solid mass, without any cavity in either. In a child, examined after death by HUFELAND, no trace of genital organs, peculiar to either sex, was found, externally or internally. Although such instances are rare, there is no doubt that one or more of the different parts forming the female organs may be wanting. Congenital narrowness of this passage has been observed in a very few instances. In one or two of these, however, impregnation occurred, and the passage became enlarged in the progress of gestation. Contraction of the vagina was said to have existed in the celebrated Joan of Arc. The division of the canal by a septum has been met with in a very few cases only. Firm adhesions of the labia pudendi are not unfrequent in children, in consequence of neglected excoriation or inflammation. I have seen several instances of these adhesions of various extent, duration, and firmness. They are more rare in females after the age of puberty; but they have been met with at this age by BENEVOLI, MERRIMAN, RYAN, TUCKER, and others, and in some cases, they have been so complete, as nearly to prevent micturition. Inflammation or injuries, by instrument, or otherwise, during parturition, have been followed by adhesion of the sides of the vagina, and total obliteration of the canal. Several of the instances of obstruction by a strong membrane placed at the commencement, or in some part of the passage, recorded by FABRICIUS HILDANUS, RUYSCH, AMBROSE PARÉ, BENEVOLI, FODERÉ, PHYSICK, and others, may be imputed to adhesions long previously formed, which have subsequently assumed an organised and membranous state, rather than to an inordinately firm and resistant hymen. The hymen may, however, be thickened and hypertrophied, and be a cause of impotence by preventing intercourse. Yet impregnation may be effected nevertheless, as proved by numerous cases. This state of the membrane is therefore not productive of absolute impotence, even should it be allowed to continue; and it is not a permanent cause, as it may always be removed by an operation. Complete prolapsus or procidentia of the uterus, retroversion of the uterus, prolapsus of the vagina, cancer of the vagina or uterus, and extreme brevity of the vagina, are generally productive of impotency, although impregnation has occurred in rare instances, notwithstanding these lesions.

20. *B.* STERILITY may proceed from absence of the uterus, or of the ovaria, or of both. When the uterus is wanting, the vagina is usually short. It may also proceed from a scirrhous or indurated state of this organ, from tumours in its substance, from polypi in its cavity, or attached to its neck, from occlusion of the Fallopian tubes, or adhesion of their fimbriated extremities to adjoining parts, from narrowness or entire obstruction of the os uteri, and from disease of both ovaria. Several of these require further remark. Extreme constriction of the os uteri has been shown by Dr. MACINTOSH to be productive of difficult, painful, or obstructed menstruation, and it most probably is also one of the causes of sterility. The mouth of the uterus may be completely obstructed by agglutination of its sides, or by a false membrane stretched across it, either internally or externally. The openings of the Fallopian tubes may be also closed by a membranous production, or by an albuminous exudation from the internal surface of the uterus. The tubes may be either partially or altogether obliterated, in consequence of the extension of inflammatory action to them, from the uterus or adjoining parts. When these alterations extend to both tubes, sterility must necessarily result. Although tumours developed in the body or neck of the uterus, and polypi attached to its internal surface, generally prevent impregnation, yet instances have occurred, in which conception has nevertheless taken place. These are however, very rare, and abortion has always occurred during the early months. A tumour or polypus may be formed on the internal surface of the uterus, and yet after its removal, the patient may conceive and bear a child at the full time. A case illustrative of this has been recorded by Dr. BEATTY.

21. The above causes are mostly productive of absolute or permanent sterility; but there are others, which are either relative, or admit of removal. These are chiefly, too profuse, or too frequent, and difficult menstruation, constant or profuse leucorrhea, inflammatory affections of the uterus, or of its appendages, dislike, disgust, and indifference on the part of the female, &c. Profuse or frequent menstruation is a more common cause of sterility than is generally supposed; this state, particularly when associated with irritation of, or increased vascular determination to, the womb, preventing the retention of the ovum, until it has undergone the changes necessary to its attachment to the uterus. Leucorrhea is a cause of sterility chiefly when it depends upon inflammatory irritation of the internal surface or neck of the uterus, or when the secretion proceeds from relaxation of the vessels in this situation. When it is a consequence of inflammatory action, sterility may continue after the discharge has ceased, owing to organic changes in the surface of the uterus, or in the Fallopian tubes, especially the formation of a false membrane in the former, and the production of an albuminous exudation in the canals of the latter, or consequent obliteration of them. When barrenness depends upon leucorrhea proceeding from local relaxation, or general debility, it may be removed upon the disappearance of its cause. Delayed, retained, obstructed, or suppressed menstruation frequently occasions sterility. Some females have, however, conceived, who have never menstruated; and the mere suppression or obstruction of the catamenia may or may not prevent impregnation; various other contingent changes, or concurring circumstances, either favouring or preventing this result. Difficult menstruation is sometimes a cause of sterility, but its influence also will depend much upon other circumstances. That form, however, of dysmenorrhea, described

by Dr. DUNCAN and Dr. DEWEES, which appears to depend upon the formation of a membranous substance in the uterus, having a strong resemblance to the decidua, is very generally productive of barrenness; but this is only one of the several forms which subacute or chronic inflammation of the uterus assumes, either of which may occasion temporary or permanent sterility.

22. There are other causes of temporary or relative sterility. Among these the most common are too frequent, yet inefficient sexual intercourse, too early marriages, general ill-health, and debility or exhaustion of the female organs, owing to premature or too frequent excitement. Various circumstances connected with sterility in prostitutes have, perhaps, thrown some light upon certain of the causes of this state; and particularly the fact, that many of this class have had children after marriage, or after relinquishing promiscuous intercourse. Numerous instances have occurred of females who, having been obliged to marry contrary to their inclinations, have not conceived, and yet have had children from a second marriage. It is generally understood by females of all ranks in society, that indifference during intercourse, or suppression of the orgasm will prevent impregnation; and, although they are sometimes deceived in this respect, yet their inference is correct in the majority. This is one of the principal causes of the sterility of prostitutes, other circumstances, however, besides those just alluded to, combining with it, to produce this effect in them.

23. III. TREATMENT. The treatment of impotence and sterility depends entirely upon the causes of either the one or the other, as far as they can be known. Many of these causes may be fully ascertained, and the consequences correctly anticipated; but as to the existence of others, inferences only can be drawn from a number of circumstances, and these inferences cannot be always fully confided in. Most of the organic lesions and deficiencies, enumerated above, cannot be remedied, yet a few of them may be assisted by art, either temporarily or permanently. But many of the functional and moral causes, and their effects, may be entirely removed. Absence of an organ or part essential to the function of generation in either sex is generally productive of impotence and sterility. Yet an imperfection only, and disease, of one or more of these organs occasioning either inability in the male or barrenness in the female, may be remedied. Adhesions of the prepuce to the glans penis, phymosis, strictures of the urethra, fistulous openings in the course of the urethra, some of the diseases of adjoining parts that prevent intercourse, paralytic and debilitated states of the penis, and the slighter injuries of the testes, may be permanently removed, and their consequences disappear. Contractions of the vagina, and even constriction or narrowness of the os uteri, occlusion of the entrance of the vagina by adhesions of the labia, or by a morbidly dense hymen, or by a false membrane, prolapsus or procidentia of the uterus or vagina, uterine polypi, leucorrhea, difficult or painful menstruation, and inflammatory states of the uterus may be severally remedied, and, although sterility may not be always, it will be frequently, also removed.

24. Cases of impotence and sterility from moral and functional causes are the most common; and, although they require the most scientific and judicious treatment, yet the mental, as well as the physical imbecility, that often characterises them, brings them more frequently in the hands of pretenders and emperics, than in those of the qualified practitioner. The cases which proceed from these causes may be arranged into 1st. Those which depend upon exhaustion; 2d. Those which proceed from disuse, or from an imperfect exertion, of the function; and, 3d. Those which arise from excessive mental and physical excitement, relatively to the susceptibility and sensibility of the nervous system.—*a*. When impotency and sterility proceed from *exhaustion*, or from a premature decay of the generative functions, owing to premature, unnatural, or excessive excitement, the treatment is nearly the same in both sexes, according as either may be chiefly or solely affected. In these cases the indications are, to restore — 1st. The energies of the constitution; and 2d. The functions of the procreative organs. To attempt the second, without either previously or contemporaneously fulfilling the first indication, will generally be futile, and often injurious. Persons, who are thus exhausted, sometimes perpetuate their infirmity by having recourse to noxious excitants, and to the means advised by emperics. The scientific practitioner will be guided in the selection of remedies, by the causes, circumstances, and phenomena, connected with the case; and he will find it necessary to associate a moral or mental regimen with the physical means which may be required. When the affection depends upon an excited imagination, in connection with a depraved habit, the former part of the treatment is the most necessary, but the most unpleasant for the physician to prescribe, and the most difficult for the patient to adopt. In these cases the mental weakness has advanced, *pari passu*, with the constitutional and local infirmity, until the mind has become incapable of exerting its more reflecting and moral powers. It will, therefore, be often necessary to restore the energy of the nervous system by suitable diet, appropriate medicines, regimen, occupation, and change of air, before the moral part of the treatment will receive due attention from the patient.

25. In other and slighter cases, the debility is principally local, the general health as well as the mental energies, remaining only partially or but little impaired. In these, the local, constitutional, and moral means of cure, will frequently prove successful, especially in the male. In this sex, when the inability depends chiefly upon weakness of the sexual muscles, invigorating modes of treatment, general and local, usually remove it, if its causes be avoided. In all these, attention to the digestive and secreting functions, vegetable or mineral tonics, especially the preparations of iron, and chalybeate mineral waters, the shower bath, or the cold salt-water bath with regular exercise in the open air, mental occupation, and early hours, will generally be most beneficial. Where the patient is subject to discharges from the urethra upon passing a stool, or on the excitement of sexual desire, a turgid and irritable state of the prostate gland may be inferred. When he is liable to frequent emissions during sleep, an irritable condition of the testes, and of the *vesiculæ seminales* obviously exists. In these, the more cooling tonics and the more astringent chalybeates may be employed, particularly the mine-

ral acids, alone or with bitter infusions, and the tincture of the muriate of iron, aided by the regimen already stated. When the general and local astheniæ are great, a moderate use of wine, of warm spices and aromatics, with as full and nutricious diet as the digestive organs can dispose of, will also be requisite. But the mental and local causes of sexual excitement should be avoided, so that the function should not be exerted beyond what may be necessary to restore and to fortify it.

26. When impotence in the male depends upon a too frequent exertion of the sexual function, the means of cure are sufficiently obvious. Yet the patient may be unable, from mental or nervous weakness, to exert the control necessary for its cure. In such a case the usual restorative remedies should be prescribed, especially chalybeates and cold sea-water bathing. In most of these, the male organs are so irritable, that their functions are performed too rapidly and imperfectly, or before the organs, more or less necessary to procreation, can be excited in the female. At the same time, the male secretions are inadequate, particularly in respect of elaboration and retention in the *vesiculæ seminales*, for the accomplishment of the purpose for which they are intended. This form of male impotence and sterility is commonly produced by masturbation, and is most benefited by whatever will improve the general health, and restore the tone of the sexual organs. Attempts at intercourse in these cases should not be more frequently than may strengthen or promote the function, without exhausting or weakening it.

27. The *other states* (§ 7, 8.) of functional impotence and sterility above alluded to, hardly require a particular notice, as they are temporary only, and soon disappear, as circumstances generally arise which soon remove their causes. It is, indeed, chiefly to the removal of the causes, that the attention of the physician should be directed, in the treatment of this complaint in both sexes.

28. In ancient times, and recently in some countries, both civilised and savage, the removal of impotency and sterility by the use of heating substances, supposed to possess aphrodisiac properties, was generally attempted. The prematurely aged, worn out debauchees, and the community generally, in some parts, especially in China, Japan, Africa, &c., often employ substances which are reputed to possess these properties. But the effects they produce, when they produce any, are more commonly injurious than beneficial. Musk, ambergris, cantharides, phosphorus, opium, the hot spices, aromatics, coffee, vanilla, borax, genseng, castor, saffron, &c., are supposed to possess aphrodisiac virtues; and a diet consisting principally of fish or of shell-fish, has a similar repute. Circumstances may arise in which it may be proper to prescribe certain of these, as possessing stimulating and restorative properties; but others of them ought to be employed with extreme caution, particularly cantharides, phosphorus, and borax. The nostrums said to possess the virtues in question ought not to be resorted to. Certain articles of food, as pigeons, eggs, particularly raw or undressed eggs, caviàre, herrings recently pickled, oysters, truffles, &c., may be employed, as being at least harmless; but the less that heating medicines are prescribed the better, unless under certain circumstances, which may occur to require them; as in cases where the sexual function has not been restored after exhausting and depressing diseases, or after prolonged exertion of the mind on abstract subjects. I was very recently consulted by a gentleman about forty, who had no return of the sexual function after a severe attack of influenza a twelvemonth before. He had perfectly recovered from it in other respects for several months, and the remaining imperfection was a source of distress to him. In a case of this kind, the physician should at least know the means most likely to be of service, particularly as the inability may become a matter of family trouble, as well as of individual misery. Kæmpfer states, that a combination of musk, ambergris, opium, and aromatics, in the form of small pills, are much employed by the Chinese and Japanese as an aphrodisiac; and I believe that it is not without some degree of efficacy. But it is very obvious, that the prolonged or too frequent recourse to these and similar substances is most injurious, both morally and physically.

29. The *sterility of females* must be treated with strict reference to the causes, as far as they may be ascertained or inferred. When it is chiefly functional, and induced by exhaustion, or by the noxious practices already alluded to, the means of cure are very nearly the same as have been here recommended, especially attention to the digestive and uterine functions, the use of chalybeates, or of chalybeate or other tonic mineral springs, with air, exercise, and early hours. For them also, the cold salt-water bath, the shower bath, or the salt-water *douche* on the loins, will also be of great service. The importance of a due regulation of the mind, of healthy occupations, and of abstemiousness, should be duly estimated.

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INDIGESTION. — SYN. *Δυσπεψια* (from *δυς with difficulty*, and *πεπτω, I digest*), *βραδὺπεψια*, *απεψια*, Gr. *Concoctio tarda*, *Stomachi resolutio*, *Cruditas*, *Indigestio*, *Passio Stomachia*, Auct. Lat. *Apepsia*, Vogel. *Soda*, Linnæus. *Anorexia*, Sagar. *Bradypepsia*, Sauvages. *Dyspepsia*, Swediaur, Cullen, Parr. *Dyspepsia Simplex*, Young. *Limosis Dyspepsia*, Good. *Schwere Verdauung*, *Uebel Verdauung*, Germ. *Indigestion*, Fr. *Indigestione*, Ital. *Bad digestion*, *Slow digestion*, *&c.*

CLASSIF. — 2. *Class*, Nervous Diseases; 2. *Order*, Defect of Vital Energy (*Cullen*). 1. *Class*, Diseases of the Digestive Function; 1. *Order*, Affecting the Alimentary Canal (*Good*). I. CLASS, I. ORDER (*Author*, in *Preface*).

1. DEFIN. — *Impaired or fastidious appetite; slow and difficult digestion; sensations of discomfort referrible to the stomach, and frequently costiveness.*

2. *Dyspepsia* or *indigestion* has been employed as the generic designation of several disorders ranged under it as species, by most modern writers, and particularly by SAUVAGES and CULLEN. YOUNG and GOOD have limited the meaning of the term, by considering some of those disorders as altogether distinct from it. Dr. TODD, however, in an able and comprehensive article on the subject, has applied this term to all the functional disorders of the alimentary canal. Having discussed several of the affections viewed by some writers as species of indigestion, in separate articles, according to their natures and seats (see articles, CŒCUM, COLON, COSTIVENESS, DUODENUM, FLATULENCY, PYROSIS, STOMACH, *Painful affections, and inflammation of*), my observations, at this place, will necessarily be confined to the simpler forms of this disorder.

3. *Indigestion* is either *primary* or *secondary*, — *idiopathic* or *symptomatic*, *simple* or *complicated*. When it is *complicated*, it may have been either the primary or the secondary affection. Dr. TODD distinguishes between symptomatic and sympathetic dyspepsia; and remarks that, " a *secondary* dyspepsia may be conveniently divided into *symptomatic*, forming only a part of a more general disease, and *sympathetic*, the consequence of consent with the disorder of some other organ." The distinction is, in some respects, wanting in precision, but it may be preserved as being one usually recognised.

4. The *varieties* or *forms* of indigestion have been variously described, named, and arranged, by the numerous recent writers on this disorder; and a most eager disposition has been evinced by all, to assign new terms, and to devise distinct pathological states, for each. In some instances, distinctions have been multiplied to an extent bewildering the inexperienced, and beyond the actual morbid manifestations of the organs affected. It will be readily admitted, that different forms of indigestion will depend upon different states of the stomach, and of its associated viscera; that, in one, the organic sensibility will be especially affected; in another, the secretions; in a third, the muscular contractility; in a fourth, the circulation; in a fifth, two or all of these functions; and that these particular affections will be variously associated with disorders of the liver, or of the pancreas, or of the duodenum, and not merely with these, but with others in remote organs. Yet these individual affections, even in their simpler or less complicated states, will seldom be manifested by symptoms enabling the most close observer to determine, with precision, which of them is the one actually present, either in a simple or predominant form, or the exact associations to which it may have given rise. It will, therefore, be proper not to multiply distinctions beyond those which will be found useful for practical purposes. The disorder which proceeds from a simple diminution of the functions of the stomach, — from impaired secretion, weakened organic contractility, and languid circulation — from asthenia of the organ, — will, with propriety, form one variety of indigestion; and that which depends upon a state of erethysm, or vascular irritation, approaching, but not amounting to, inflammation of the villous surface, will constitute another. This latter, especially, will present certain modes, according as the sensibility, the villous membrane, or the follicular apparatus, is prominently affected. Those states of disease which are generally consequent upon dyspepsia, although sometimes appearing independently of it, and which have been classed by some writers as severer forms of this complaint, will be found under the heads referred to above.

5. I. DESCRIPTION. — i. SIMPLE ASTHENIC DYSPEPSIA; — *Stomachi Resolutio*, CELSUS, — *Frigiditas Stomachi*, PROSPER ALPINUS, — *Dyspepsia Idiopathica*, CULLEN, — *First Stage of Indigestion*, W. PHILIP, — *Atonic Gastric Dyspepsia*, T. J. TODD, — *Dyspepsia per Asthenie de l'Estomac*, ANDRAL, — *Dyspepsia Apyrétique As-*

thénique, BROUSSAIS; — is *characterised* chiefly by a sense of distention of the stomach, by acrid or acid eructations, and flatulence, soon after a meal; by loss of appetite, or loathing of food, and occasionally by nausea. These symptoms, however, vary with the nature and quantity of the food. Heartburn, nidorous or putrescent eructations, and a feeling of weight or oppression at the epigastrium, are generally present after a very full meal, particularly of fat, oily, or rich meats. The tongue is pale, flabby, whitish, slimy or coated, and often indented by the teeth; the bowels are costive, sometimes irregular; the urine is pale, copious, and occasionally deficient of urea, or contains albumen; the pulse is softer, weaker, and often slower than natural; the temperature is diminished, or irregularly distributed, the extremities being cold, and the surface pale, or flaccid; the eyes are languid, and the physical and mental powers deficient in vivacity and energy. The symptoms, however, vary much in grouping and intensity with the kind, quantity of the solid and fluid ingested, with the temperament and constitution, and with the manner in which associated viscera are sympathetically affected. In some cases, they are gradually and very slowly developed by the continued operation of the causes; in others, they are more rapidly or suddenly induced by errors in diet, or by other powerful circumstances.

6. *A*. The latter, or the *more acute* and *sudden attacks of indigestion*, are generally consequent upon some manifest cause, particularly an overloaded state of the stomach, — and is identical with the *cruditas* of the ancients, and the *embarras gastrique* of the French. — It may occur, however, from substances which disorder the organic sensibility of the viscus, or from other causes. When it proceeds from this source, the symptoms soon follow a full meal, or appear in the morning. The patient experiences various uneasy or even painful sensations, with oppression or weight at the epigastrium, and heart-burn. These often extend to the pharynx. The tongue becomes dry, clammy or loaded, and the taste is lost or perverted. Rancid, oily, indigested, or acid substances are eructated or brought off the stomach, without nausea or retching. There are generally headach and languor. If nausea and vomiting take place, the contents of the stomach are thrown up, either partially or altogether undigested, with a ropy phlegm. Where vomiting does not occur, a sense of irritation or constriction of the fauces and pharynx, with a copious secretion of a watery fluid, and pains in the stomach, are often present. The appetite is abolished, or savoury articles of food are only relished. When the fit of indigestion occurs during the night, the patient experiences frightful dreams, or the nightmare, or spasmodic twitchings of the limbs, or severe pains in the stomach or bowels, or wakens with severe headach. The pulse is weak, languid, or soft; the skin cool and moist, and the extremities cold. Frequently chills, horripilations, formications, or even slight shudderings occur. Various sympathetic affections often attend this state of dyspepsia, particularly headach, as described in that article, impaired or indistinct vision; muscæ volitantes, noises in the ears, and dullness of *hearing;* disorder or impairment of the senses of taste and smell, palpitations, and vertigo, colicky pains in the abdomen, costiveness, &c.

7. An attack of dyspepsia in an acute or sudden form seldom appears, unless from the causes just alluded to. But it may proceed, particularly in delicate persons or females, from other causes, as powerful mental impressions, long fasting, or deprivation of wonted stimuli. In such cases, vomitings, or even retchings, rarely occur; but nausea or disgust at food, giddiness, headach, faintness, sinking or pain at the epigastrium, costiveness, palor and coldness of the surface, and inactivity, with irritability of temper, with some of the other symptoms already noticed, are commonly complained of. — These *acute* attacks are liable to pass into the more *confirmed* or chronic state of the complaint, next to be described, particularly when they recur frequently, or are neglected.

8. *B*. The *confirmed* or chronic form of dyspepsia may take place gradually or slowly, or as a consequence of the foregoing. In the former case, it is almost imperceptible in its progress, but it generally commences with symptoms of general, as well as local, debility. All the physical and mental functions betray more or less inactivity. The sleep is disturbed or unrefreshing, sometimes heavy or prolonged. The appetite in the morning is impaired and capricious, savoury articles being chiefly relished, and a sense of soreness or relaxation in the throat is often complained of. A full meal is followed by heaviness, yawnings, stretchings, and an almost irresistible disposition to sleep, by sense of fullness, weight, flatulence, or by rancid or acrid eructations, &c. As the disorder continues, the appetite is more impaired and more capricious. The bowels become costive or irregular; the discharges being scanty, offensive, discoloured, or more copious or frequent, and sometimes containing imperfectly digested portions of food. The biliary secretion is either insufficient or disordered. Perspirations are copious on exertion, often offensive, and quickly discolour the linen. Flatulence is troublesome, particularly when the stomach is empty; the mouth is clammy, and the tongue loaded or furred, especially in the morning. The countenance becomes pale or unhealthy; and the body occasionally enlarges about the trunk or abdomen. Vertigo, loss of memory, lowness of spirits, apathy, indifference; and numerous associated and sympathetic disorders supervene, according as the asthenia of the stomach extends to the duodenum and intestinal canal, or to the secreting collatitious viscera. In many cases, the affection extends along the æsophagus to the pharynx and fauces, occasioning the slightest forms of angina, or simple relaxation of the uvula.

9. As dyspepsia becomes confirmed, various additional sympathetic affections appear. Indeed there is scarcely a viscus, that may not betray disorder. Irritation about the larynx, chronic cough, particularly in the morning; huskiness of the voice, or hoarseness; copious perspirations, and eruptions on the skin; dry and parched state of the hair, or morbid condition of the cuticle and of the nails; great sensibility of cold, and also of heat; are very commonly observed. Shortness of breath on slight exertion; palpitation of the heart; intermissions and irregularity of the pulse; and other sympathetic disorders about to be noticed, often also appear. This variety of indi-

gestion, when neglected, or when its causes continue in operation, sooner or later passes into one or other of the forms of the variety, next to be described.

10. ii. Indigestion with vascular Erethism, —*Irritative Dyspepsia ; Cardialgia Inflammatoria*, Sauvages, — *Gatsrite Chronique*, Broussais, — *Second Stage of Indigestion*, W. Philip,—*Inflammatory Gastric Dyspepsia*, T. J. Todd, — is *characterised* chiefly by slow and painful digestion, a sense of heat and discomfort at the epigastrium, increased by food and by pressure, with thirst, dryness of the mouth and fauces, redness of the edges and point of the tongue, whilst the middle and root are white, loaded, or furred ; costiveness, high-coloured urine, partially increased temperature and dryness of the skin, and a more frequent and sharp pulse than natural. It offers several *grades* of severity and various *modes*, according to the exciting cause, the temperament of the patient, and to the manner in which the organic sensibility and contractility, the secretions and associated viscera, are individually implicated. It may appear suddenly in an acute form, when the cause has been active, or gradually and slowly, either primarily, or consecutively upon the variety already described.

11. *a*. In the *slighter states* of irritative dyspepsia, the appetite is often increased, occasionally ravenous, in some instances impaired ; thirst is generally present, particularly in the evening. The extremities are often cold ; but burning or heat of the soles of the feet and palms of the hand frequently occur, particularly in warm or temperate weather. The point and edges of the tongue are red, the papillæ raised or excited, and the root more or less loaded ; the bowels are confined, and the stools dry and scanty. The pulse is somewhat excited, especially in the evening, and rather sharp than hard or contracted. Headach, sometimes with slight redness of the conjunctiva and contraction of the pupils, heaviness, unsound sleep, unpleasant dreams, and a feeling of fatigue and lassitude upon waking, are generally present. The symptoms referred directly to the stomach, at first, are often not more severe in this, than in the preceding, variety ; and pain, with tenderness on pressure, is not more frequently complained of. As the complaint, however, becomes more chronic, a burning pain is felt at the stomach, and is increased by a full meal and by pressure. Great discomfort and a sense of a load are referred to the region of this organ. Fulness or distension at the epigastrium, often extending to one or both hypochondria, is usually present. When heartburn occurs, it is characterised by a sense of heat or burning, and attended by redness and soreness of the fauces and pharynx. The tongue and throat are frequently dry, and the voice soon becomes husky on speaking, or on exerting it. Small vesications occasionally appear on the sides and points of the tongue, and more rarely excoriations on the fauces. In protracted cases, the tongue is often smooth, sometimes slightly fissured or chapped, or lobulated, or even glossy. Pain is felt in the left shoulder, or in the left hypochondrium, extending to the shoulder blade, or between the scapulæ, and beneath the sternum. Severe headach ; irritability of temper ; depression of spirits ; impaired appetite; palpitations ; a harsh, dry state of the skin, frequently with scaly eruptions ; occasional bursts of perspirations during sleep ; inability to lie on the left side ; burning heat in the palms of the hands and soles of the feet ; increased acuteness of the senses, or obscuration of certain of them ; and a morbid state of all the excretions, severally appear, and often divert the patient's and practitioner's attention from the source of disorder. In some cases pain, often increased by flatulence, shoots through the hypochondria and chest, and a symptomatic cough, with slight greyish expectoration in the morning, is excited, owing to nervous connection, and to the extension of irritation to the pharynx and top of the larynx. In these, pectoral disease is sometimes suspected ; and inflammatory irritation of the larynx may be actually thereby occasioned.

12. *b*. In the more *severe or acute attacks* of this variety of indigestion, particularly when produced by hurtful or indigestible food, or stimulating liquors, there is a total and sudden loss of appetite, with nausea, retchings, or full vomiting, increased by, or instantly following, the ingestion of substances into the stomach. Occasionally, the contents of the organ are regurgitated without effort or nausea, but with pain or a sense of constriction at the epigastrium and hypochondria. The pulse, is at times, but little affected ; at others, quick and sharp, and the skin is harsh and hot ; but perspirations break out when free vomitings are induced. There is always thirst ; pain, or a sense of burning, of scalding, or of soreness is generally felt in the stomach, and it often extends, in the course of the œsophagus, to the throat ; giving rise to a similar symptomatic affection of this part, and of the larynx and chest, as just noticed (§ 11.). In rare instances, however, where the retchings and vomitings are frequent and severe, but little pain, and no tenderness in the epigastrium are present, or much less than the severity of the symptoms indicates. The copious discharge from the mucous follicles and exhalents of the villous coat in these cases, removes the congestion of vessels, or the morbid conditions productive of pain and tenderness in other cases. But the symptoms vary remarkably with the exciting cause, with the temperament and disposition of the patient, and with the previous disorder and existing state of the collatitious viscera.

13. *c*. In the *aged*, or in *young persons of a phlegmatic temperament*, and in *cold* or *damp climates* and *seasons*, irritative dyspepsia assumes a form which has been denominated *Anorexia pituitosa*, *Anorexia Catarrhalis*, *Catarrh of the Stomach*, &c., by various writers. Dr. Todd has called it *Follicular Gastric Dyspepsia ;* and most probably it proceeds from an inordinate and morbid secretion from the follicles of the stomach, that irritates the organ ; but he has improperly confounded it with *Pyrosis*, which it closely resembles. It is characterised by an aching pain, by gnawing, or by a sensation of cramp, weight and uneasiness, or soreness, felt chiefly in the morning, when the stomach is empty, by loss of appetite, nausea, and sometimes by vomiting of a ropy, transparent, glairy, and tasteless fluid. It is often complicated with, or consequent upon, severe catarrhal affections of aged or phlegmatic persons, and is not infrequent in rheumatic constitutions, after errors in diet, and the use of indigestible, rich, or incongruous articles of food or drink. In this case, it usually occurs in the night and fol-

lowing morning. Along with indigested substances, a very large quantity of this colourless glairy matter is thrown up, and often continues to be ejected for a considerable time afterwards. M. ANDRAL has seen it thrown off in very large quantities, independently of the irritation of offending matters; but these matters are more commonly concerned in keeping up the morbid secretion. In most of the cases I have seen, the pulse was soft, languid, sometimes sharp during the attack, which was attended by a foul, loaded, or sodden state of the tongue, a warm perspirable surface, or free perspiration, much depression of nervous power, and constipation; but there was little or no thirst, nor tenderness or increase of pain on moderate pressure of the region of the stomach. Flatulence, eructations of an insipid or slightly acid fluid, a copious flow of saliva from the mouth, or of a watery fluid from the pharynx, and oppression or distention of the stomach, although pain is much abated, after eating, generally accompany the disorder. This form of irritative dyspepsia is often preceded or attended by severe catarrhs, by dyspnœa, or humoral asthma, or by rheumatic affections; and it is most common in cold and wet seasons, when these are prevalent. In its slighter or less acute states, or when appearing independently of over-distention or irritation of the stomach by bulky or indigestible substances, the pulse is usually slow or soft, the extremities cold, the evacuations scanty or mucous, and the tongue white, sodden, or loaded. As Dr. TODD remarks, there is a frequent desire to take food, with thirst, and, as the disease continues, there is wasting of the flesh. The uneasiness caused by the laborious digestion subsides as the process is finished; but before the time of taking food arrives, the stomach becomes irritated by its own secretion, which produces all the inconvenience of a foreign indigestible substance in that organ; such as a sense of sinking, of dragging, of nausea, faintness, gnawing, or erosion, which are again, for a time, relieved by the taking of food. (See art. PYROSIS.)

14. iii. OF CERTAIN SYMPTOMS OF INDIGESTION. — *A. Cardialgia*, or *Heartburn*, presents itself in two forms, each of which assumes various grades of severity. It is generally attended by *acid* or acrid eructations, exciting irritation in the throat and fauces. The acidity of the eructated matters is often remarkable, occasioning the most unpleasant sensations in the mouth and pharynx, with a copious flow of fluid from those parts. The matters brought up from the stomach are sometimes rancid and *alkaline*, particularly after a full meal of rich or fat animal food. In this case, a feeling of disgust is excited on each eructation, and large quantities are thus thrown off, or regurgitated from the stomach, without either nausea or retching. In either form, unpleasant gnawing, burning pain, and tenderness, are felt at the epigastrium, with distention, extending to the hypochondria, and with tightness or oppression in the chest. Cardialgia chiefly occurs during the period of digestion, but sometimes not until an advanced stage of the process. It may be mild, and consist simply of uneasy sensation, gnawing, or burning at the cardia, sometimes with slight faintness or flatulence; or it may be severe, the uneasiness extending over the region of the stomach, attended by depression, anxiety of countenance, and faintness. This latter state has been denominated *sinking heartburn*. It is only when cardialgia is severe, that it is accompanied with frequent and copious, rancid, alkaline or septic eructations.

15. *B. Of the Evacuations, &c.*—*a*. The *stools* furnish comparatively little information in dyspeptic ailments, when only those procured by an active purgative are examined. They are most commonly scanty, dry, and deficient in healthy odour and colour, especially in the asthenic and simple states of the complaint. In the irritative states, the discoloration is often greater, and they are occasionally mucous or watery, particularly when irritation extends along the alimentary canal. But in either variety, they vary remarkably in colour, consistence, and character; being either dry, pultaceous, slimy, scybalous, mucous, bilious, clayey, whitish, or yeasty, and sometimes presenting several of these appearances at the same time. The calls to evacuation are commonly rare or delayed, but they are occasionally frequent and inefficient. It is chiefly when torpid or disordered function of the liver, duodenum, or intestinal canal, is associated with indigestion, that the states of the evacuations described by Dr. W. PHILIP are met with; for these states, as Dr. J. JOHNSON justly contends, are not common in the simpler forms of the complaint. "The alvine discharge," the former writer remarks, "sometimes chiefly consists of bile; its colour at other times is too light, more frequently too dark, and occasionally almost black; at different times it assumes various hues, inclining to green or to blue; and sometimes it is mixed with, and now and then almost wholly consists of, undigested bits of food." When there is much straining, it often contains mucus, sometimes in distinct masses, or substances resembling bits of membrane. "It frequently separates from the canal with more difficulty then usual, and leaves a feeling of the bowels not having been completely emptied."

16. *b*. The *urine* of a person in good health is perfectly clear and limpid when passed, and continues so for some time after it cools, being more or less deep in colour, according as its ingredients are concentrated or diluted. But it has been satisfactorily shown, that when acidity is prevalent in the stomach and digestive canal, or when the usual acid secretion of the skin is impeded or suppressed, the urine, after standing for some time, deposits a reddish substance, which is found to be a coating of lithic acid, the supernatant fluid still remaining clear; but when an opposite condition to this exists in the digestive organs, the contents of the stomach being alkaline or devoid of their proper acidity, and when the function of the skin is unusually excited, the urine becomes turbid, and a whitish, or purulent white, sediment is observed, consisting of lithate of ammonia, or of an amorphous deposit of phosphates and lithates. If irritation or inflammatory affection of the stomach is present, this fluid is scanty and high-coloured. In irritability of the organ, it is often pale, limpid, and very copious. In several states of indigestion, it occasions smarting in its passage, owing to the unusual abundance of urea. Dr. PROUT observes, that in one or two cases of obstinate dyspepsia, he has seen the urine not only passed of a bright pink colour, but remain so on cooling, without depositing any sediment; and he considers this pink colour to proceed from the large quantity of purpurate of ammonia present, which, from there being no lithate of ammonia with which it might be combined, was necessarily held in solution.

17. *c. Pain and tenderness at the epigastrium* and region of the stomach have been much insisted upon by Dr. W. Philip, as indicative of the more inflammatory states of dyspepsia. But as I have shown elsewhere (see Stomach — *Morbid Sensibility of*), the most severe pains in this organ are often felt without any inflammatory disposition. Tenderness upon pressure is a very common symptom in the slight or more functional states of indigestion, as well as in the severe or more inflammatory, especially in thin and delicate persons. It is seldom wanting in irritative dyspepsia. The tenderness is often connected with *fulness* in this region, and also in the hypochondria. But this latter symptom is generally owing to the distention caused by flatus, and by feculent and flatulent collections in the colon. When emaciation takes place in protracted cases, the fulness becomes more apparent.

18. *d.* The *pulse*, in dyspepsia, is extremely various, but it is most commonly as I have described it. During the digestion of a full meal, it is usually accelerated, and somewhat harder or sharper than usual. The hardness insisted on by Dr. W. Philip, as indicative of the passage of functional into inflammatory dyspepsia, is seldom present. Sharpness and quickness are more frequently observed, and are symptoms of irritation rather than of inflammation. The febrile symptoms occasionally occurring, with soreness of the throat, high-coloured urine, and impaired secretions, are more probably occasioned by the former, than by the latter pathological state.

19. *C. Of the states of the associated viscera in dyspepsia.* — It is obvious that indigestion will vary in form and severity, with the concomitance of disorder in any of the other digestive organs. — The functions of the Duodenum may be deranged, as shown in that article; and, in this case, dyspepsia will present more or less of the characters there described (§ 2.). Other parts of the digestive canal may be deranged, the affection consisting either in impairment of function, or in nervous or vascular irritation, and being limited to the small intestines, or to the large bowels, or even to one only of the latter. (See arts. Cæcum and Colon.) In such cases, the physician will be guided by the state of the evacuations, and by the symptoms detected on a careful examination of the abdomen. — It is not improbable that the pancreatic secretion becomes disordered, particularly in protracted cases; but of this sufficient proofs are seldom furnished: at best it can be only a probable inference. That this secretion may be diminished is not unlikely, inasmuch as there is sufficient evidence of the *biliary secretion* being deficient, retained, and altered, especially in the chronic states of indigestion; and it is reasonable to infer, that, when one of the organs deriving influence from the same part of the nervous system is impaired in its functions, the other organs thus associated, as well as otherwise anatomically connected, will be similarly, if not coordinately, affected. Indeed, every experienced practitioner must have noticed a more or less remarkable deficiency, or other disorder of the bile in dyspepsia; and not only of it, but also of the other secretions poured into the intestinal canal. That the disorder originally induced in the stomach, often extends to the other digestive organs, owing to various concomitant or consecutive circumstances, cannot be doubted. It may be even apprehended, that the consecutive disorder will become the most serious in its nature and consequences, when these circumstances are frequent or continued in their operation; and that it will thereby obscure or mask the original affection. In many cases of dyspepsia, the functions of the biliary apparatus are impaired, in respect, not only of the quantity, but also of the qualities or properties of the secretion. In some, more or less of retention or obstruction of bile actually takes place, as shown by the state of the stools, rather than by the colour of the surface of the body. The remora of bile, also, in the biliary ducts and gall bladder, arising from impaired function of the stomach and torpor of the liver, will further increase the morbid state of the evacuations.

20. *D. Sympathetic affections of various organs.* — Whilst an immense number of diseases originate in neglected or protracted indigestion, various disorders are entirely sympathetic of it. Diseases of the urinary organs, of the liver and bowels, gout, rheumatism, various painful, neuralgic, and nervous affections, eruptions on the skin, disorders of the catamenia, and many others, often thus arise. Dr. Webster, in a treatise published in 1793, endeavoured to show this, before the appearance of the writings of Mr. Abernethy on the subject; but it had not been altogether neglected in the works of Whytt and others. This excellent author very justly remarks, that a delicate state of the first passages, or an unnatural sensibility of their nerves, not only disposes to many complaints in those parts, but the whole nervous system is thereby rendered more liable to be affected by the slightest causes. "Faintings, tremors, palpitations of the heart, convulsive motions, and great fearfulness, may be often owing more to the infirm state of the first passages, than to any fault either in the brain or heart. The powers which the alimentary canal, when its nerves are disagreeably affected, must have in producing disorders in the most distant parts of the body, cannot be doubted by those who attend to that wonderful and widely-extended sympathy, which obtains between it and almost the whole system."

21. *a.* The brain and organs of sense are often much affected by indigestion. *Headach* is one of the most common and severe affections, sympathetically excited by this complaint; but it has received sufficient consideration in the article on its different forms. The manifestations of *mind*, both intellectual and moral, are also often more or less disordered, although but slightly or imperceptibly. Memory is somewhat impaired; attention is unsteady and cannot be long continued; the disposition is more fickle, and the temper more irritable than natural. There are often confusion of thought, or of ideas, lowness of spirits, despondency, and vertigo, particularly in severe or protracted cases. M. Broussais has argued with much apparent justice, that the functional disorder, thus sympathetically induced in the brain, may, by its frequency or continuance, pass into organic change; and several recent writers in this country have adopted the opinion.

22. *b.* The *organs of sense* are not less liable to sympathetic disorder. — The *sight* becomes weak and indistinct; the eyes impatient of light or irritable; and specks or muscæ volitantes appear in the

axis of vision. — *Hearing* is frequently impaired, often from weakness of the nerves; but sometimes in consequence of the erythematic redness and inflammatory irritation, symptomatically produced in the throat, having extended along the Eustachian tube to the internal ear; or having caused obstruction of this canal. Noises in the ear are usually present in these cases; and these, as well as the hearing, depend much upon, and vary with, the state of the stomach. Care should be taken, however, not to impute affections of the head and of the senses, depending upon disease within the cranium, to disorder of the digestive organs. The disorders of these parts, arising from the stomach and other digestive viscera, disappear or are mitigated by wholesome food and drink, taken in moderate quantity; but when they proceed from the brain, they are aggravated, or at least, not mitigated, by the usual ingesta.

23. *c*. In the article Flatulence, I have shown the effect produced upon the actions of the *heart* by this, and other causes of distention of the digestive tube. Palpitations, and irregularity and intermissions of the pulse very often proceed from dyspepsia, particularly when the functions of the liver and of the intestinal canal are also disordered. In such cases, the morbid sounds of the heart are usually wanting, unless in some cases of severe palpitation, when a slight bellows sound is heard. The functional disorder, when frequent or protracted, may be followed by dilatation or some other organic change. When structural lesion already exists in this organ, the symptoms are much increased by indigestion, and by concomitant disorder of the liver. It should, however, be recollected, that lesions of the heart often occasion congestions of the liver and dyspeptic affections; and always aggravate them, where they already exist.

24. *d*. The influence of dyspeptic complaints in producing *affections of the lungs*, was contended for by Dr. W. Philip, doubted by Dr. Paris, but admitted, in a limited sense, by Dr. J. Johnson, and some others. The choice Dr. Philip made of the term "*dyspeptic phthisis*," was certainly not fortunate, inasmuch as its meaning is equivocal. In protracted dyspepsia, and particularly when the liver becomes congested, or otherwise disordered, the respiratory organs often also are affected; the disorder of the digestive viscera both predisposing to affections of the respiratory passages, and occasionally more directly causing them. The irritation excited in the œsophagus, pharynx, and top of the larynx, by the affection of the stomach, is sometimes propagated along the air passages; and if, at the same time, the stomach is frequently distended and the liver congested, so as to impede the circulation through the lungs, disease of this latter probably will often be induced, especially if latent tubercles, or some other states of predisposition, exist. Besides, the debility caused by protracted disorder of the digestive organs often calls latent tubercles into activity, or rapidly developes them; and it may even be suspected that the impaired nutrition, consequent upon the debility and protracted disorder of the organs of supply, will sometimes even give rise to tubercular productions, where they did not previously exist even in a rudimental state.

26. iv. The Consequences and Terminations of Indigestion have been partially alluded to (§ 19, 20.); but they require a more particular notice. (*a*) Dyspepsia may terminate in a restoration of the healthy function of digestion; — (*b*) It may pass into more severe functional or structural disease of the stomach; — (*c*) It may superinduce disease of the liver, bowels, and other collatitious organs; — (*d*) It may give rise to affections of remote organs or parts; — (*e*) and lastly, it may alter the constitution of the circulating fluids, originate diseased secretions and depositions, and generate a morbid diathesis of the system, occasioning several serious consitutional maladies. These consequences will, however, depend much on the exciting causes, the predisposition, the temperament, the habit of body, and other circumstances proper to the person affected.

27. *a*. A termination in restoration of healthy digestion seldom takes place, or if it take place, it is rarely permanent, unless the predisposing and exciting causes are avoided. Many of those causes originate in those propensities, desires, and passions, which are controlled with the greatest difficulty; and several of them depend upon habits, which require the utmost force of character to relinquish. Hence the want of success so often experienced in the treatment of dyspeptic complaints, and the dissatisfaction evinced by those who run from one physician to another, unreasonably expecting immediate or permanent relief, still desiring to indulge the senses — to gratify the propensities and desires, natural or acquired, without paying the penalties thereby incurred. Hence, also, the frequency of the serious consequences of severe or neglected dyspepsia about to be noticed.

28. *b*. The forms of indigestion already described, from neglect or the continuance of their causes, may pass into the more severe affections of the stomach. In some instances, the most violent *gastrodynia* or gastralgia supervenes on them. (See Stomach — *Painful Affections of*.) In others, Pyrosis follows the form of irritative dyspepsia attended by the rejection of a glairy fluid, (§ 13.) and seems to be an extreme condition of the same complaint with modifications depending upon peculiarities of constitution and of functional lesion. In some cases, Vomiting (see that article) of a severer or more prolonged character than that occasionally taking place in dyspepsia, occurs, even independently, although more frequently in consequence, of structural change of either the stomach or some other organ. In the latter case, the source of mischief may be in the liver, or in the brain, or even in the kidneys, or uterus. More rarely neglected cardialgia or other dyspeptic states pass into partial or complete Rumination, (see that article), particularly when the meals are taken hurriedly, in large quantity, and insufficiently masticated (see Author, in *Lond. Med. and Phys. Journ.* for May, 1821, p. 362.). Neglected dyspepsia is very frequently followed by inflammatory action, and its consequences in the villous coat of the stomach (see Stomach — *Inflammation and Organic Lesion of*). This result, I am convinced would more frequently take place, and when it did occur, would lead to still more serious effects, but for the circumstance of the secretions from the villous coat favouring resolution by unloading the capillary vessels, and for the want of appetite and nausea attending inflammatory action, preventing the ingestion of substances calculated to keep up the morbid action.

28. *c.* The supervention of disease, functional or structural, in collatitious viscera, in the course even of the more simple and slight forms of indigestion, is so common, that the attention should never be withdrawn from it in practice. There are few cases of dyspepsia, in which the functions of the Liver and Duodenum (see those articles) are not more or less disturbed. The *liver* becomes torpid and congested, and sometimes more or less tumid, from either congestion in its vessels, or accumulations of bile in the ducts; this secretion being often inspissated from absorption, during its remora, of its more watery part. It then either obstructs, irritates, or otherwise disorders the canals along which it passes (see art. Gall Bladder and Ducts), and affects even the substance of the liver itself, which ultimately becomes inflamed, and gradually and variously changed. In protracted or severe cases of indigestion, other organs also become disordered, especially the bowels; *constipation*, *colic*, or *diarrhœa*, in some one or other of their forms, frequently occurring, particularly when irritation of the digestive mucous surface is induced, and when the secretions, poured into the intestines, are deranged.

29. *d.* Affections of remote organs, sympathetically produced by dyspepsia, have been already noticed (§ 20.), but there are others which arise from this complaint, rather by a succession of morbid changes, than by any sympathy or consent of parts. When protracted or severe indigestion gives rise to an imperfectly elaborated chyle; or when the impaired organic nervous energy, which is chiefly manifested in the functions of the stomach in dyspepsia, extends also to the circulating, assimilating, and excreting organs; affections of the kidneys, and urinary bladder, in connection with a morbid state of the urinary secretion, frequently take place. Hence the formation of sabulous matter or gravel in the urine, and of calculi in the kidneys and bladder; and even the production of diabetes, and of slighter disorders of the excretion of urine, In females, dyspepsia not unfrequently occasions difficult, too frequent, or delayed or irregular menstruation, hysteria, and painful affections of the spinal nerves in some portions or other of their distribution, with tenderness in the dorsal spine. In both sexes, cutaneous eruptions either originate in, or are perpetuated by, dyspeptic disorders, and by the state of the circulating fluids, and of the cutaneous exhalation consequent upon them. A due recognition and estimation of these connections of disorder are of the utmost importance in practice.

30. *e.* There is every reason to infer, that the pathological conditions, of which dyspepsia is an early and important indication, by altering the functions of assimilation and secretion, and weakening the processes of depuration, may give rise to a state of the circulation, productive of painful affections, or of unnatural formations and depositions in weak or predisposed parts; or in other words, to a truly morbid diathesis, or constitutional derangement. Hence the frequency of rheumatism, of neuralgic or painful affections, of urinary calculi and gravel, and especially of gout, after protracted or severe indigestion.

31. II. Causes.—*A. Predisposing.*—Indigestion, although not confined to any period of life, occurs most commonly between the ages of twenty and forty-five; and in *its simple form* more frequently in the female, than in the male sex. The upper classes of society and the middle ranks of life are most subject to this variety of the complaint. It is more prevalent in cold and temperate, than in warm climates, and in the winter than in the summer; but whatever may be the temperature of the climate or of the season, damp weather, and a moist atmosphere, may be regarded as among its most active predisposing causes. The predisposition to this disorder is sometimes hereditary, particularly in persons of a weak relaxed fibre, with high nervous susceptibility, and general debility of constitution. Those in whom the functions of the stomach are naturally weak and feebly performed, the circulation languid, the temperature of the extremities below the natural standard, and the secretions generally disordered, or more abundant than usual, are also constitutionally predisposed to dyspepsia. Sedentary occupations, especially when carried on in close rooms and factories, indolent habits either of body or mind, long and intense study, insufficient exercise in the open air, addiction to debilitating excesses and injurious indulgences, luxurious modes of living, indulgence in sleep or in bed, breathing impure air and confinement to close or ill-ventilated apartments, remarkably predispose to this complaint. In persons thus predisposed, the slightest excess or irregularity, or the most trivial exciting cause, is often sufficient to bring on an attack of indigestion; whilst a repetition of such causes, or long exposure to their action, in those of a stronger habit and more vigorous constitution, cannot fail to have a similar effect.

32. *B. The exciting causes* are divisible into two classes: — (*a*) Those which operate immediately or directly upon the stomach itself; and (*b*) Those which influence this organ through the medium of other parts. — (*a*) The causes, which affect the stomach itself, act either by diminishing or otherwise vitiating its secretions, so that the due change is no longer effected in the food; or by debilitating its muscular power, so that the aliment, although it may have been properly acted upon by the gastric juice, is not propelled into the duodenum with the natural ease and rapidity. As the admixture of the food with the gastric juice, and the passage of the chyme into the duodenum can only be accomplished by the due contraction of the muscular fibres of the stomach, it is evident that, whatever tends to weaken or to impede this action, will at once be followed by oppression or distention of the organ. In this class of agents may be included narcotics, taken habitually or in excess, as opium, henbane, conium, digitalis, &c., indulgence in ardent spirits, or intoxicating liquors, and the constant or frequent use of the preparations of ammonia, of lavender, and of other aromatic spirits. But the most common causes of indigestion are, irregularity and want of due caution in diet, whether as regards the quantity, or the quality and congruity of the food, or the periods at which it is taken, and the use of tobacco in any of the modes in which this noxious substance is so generally employed.

33. A want of due relation between the state and powers of the digestive organs, and the substances upon which they are required to exercise their functions, is a very frequent cause of this complaint; for whether the stomach be distended by

an unusual quantity of food; or whether its secretion be compelled to act upon substances which are inappropriate, or to which it is unaccustomed, the function of the organ will be equally impeded; and if the exciting cause be powerful, or continue in operation, digestion will be altogether suspended. Hard and indigestible articles of food must therefore be productive of this disorder; and hence its frequency among the peasantry and lower orders. Heating and highly-seasoned articles of food, hot dishes, and condiments, mushrooms, shell-fish, melons, cucumbers, nuts, and similar substances; raw, stale, or unripe fruit; rich articles of confectionary; acid, iced, or sweet fluids, especially when taken during the process of digestion; large quantities of cold or of warm fluids, as of tea, relaxing slops, &c.; and the habitual use of malt liquor, are among the most common causes of indigestion. The kind of aliment also exerts no small influence, even in mechanically distending, and thereby weakening the stomach; for as most of the articles of food, when received into the organ, seem to swell in a greater or less degree, a bulky meal, particularly of solid or pultaceous or vegetable substances, will not a little contribute to this effect. To the above causes may be added, irregularity in the period between the times of taking food, hasty or imperfect mastication, frequent interruption or talking during the progress of eating, the omission of an accustomed meal, abstinence or long fasting,—hence its frequent occurrence during the fasts of the Catholic church, and among the Brahmins, Fakirs, &c., in India,— a sudden change in diet from animal to vegetable food, and from substances of a succulent and refreshing, to those of a dry and heating nature, and severe and repeated vomiting. All these tend, in a greater or less degree, to debilitate the muscular fibres of the stomach; to produce a deficiency of gastric secretion, or a secretion vitiated in its properties; and to irritate the villous coat of the organ.

34. *b.* Amongst those causes which operate on the stomach through the medium of other parts, may be classed those mental emotions, which depress nervous power, or otherwise disorder its manifestations. A due secretion of the gastric fluid depends much on the state of nervous influence; for a deficiency of the latter impedes or lessens the former. Any sudden intelligence, a violent fit of passion, or of great joy, sometimes instantly brings on an attack of indigestion. Grief, anxiety, envy, jealousy, indulgence in tender feelings, repeated disappointment, reverses of fortune, night watching, &c., more slowly, but more certainly, exert a similar influence. Whatever exhausts the body and lowers the constitutional powers, exerts a correlative effect on the digestive functions, as venesections improperly adopted, or soon after a meal; protracted hæmorrhages; menorrhagia; leucorrhea; venereal excesses; seminal weakness; and exhausting discharges of any kind. In persons particularly of a weak and delicate constitution, indigestion is easily induced by change of weather, by exposure to the night air or to cold and humidity, by cold extremities, by a low temperature when the body is quiescent, as when travelling in an open carriage or on the outside of stages, by a fatiguing journey, by damp residences, and similar circumstances. Whatever exerts a depressing effect on the organic nervous power, or on any of the internal viscera, will also lower the function of the stomach, as large doses of calomel, or too long a continuance of this medicine, irritating and drastic purgatives, &c. Dyspepsia may be brought on, also, by the suppression of the natural and the accustomed discharges, or by the retropulsion of cutaneous eruptions, &c. It also not unfrequently accompanies catarrhs, rheumatism, and diseases of the thoracic viscera; it is a necessary consequence of disorder of any other of the abdominal organs; and it precedes and attends the various states of gout, &c.

35. *C. The irritative states of dyspepsia* are more frequently met with in the male than in the female sex, and are very prevalent in the southern countries of Europe, and amongst Europeans resident in tropical regions. They are common in those warm climates in which the air is dry, and the temperature subject to frequent and sudden variations; but the causes acting directly on the stomach are often frequent and influential in those countries. In warm climates, the modes of living — the diet and regimen of Europeans are extremely prejudicial to the digestive functions, as shown by Mr. Annesley, and the Author. (*Researches on the Diseases of India and of Warm Climates, generally, &c.*, 4to. vol. i. p. 226.) The quantity and nature of the food and drink usually taken excite and irritate the stomach, liver, and intestinal canal, and exhaust their functions; the states of indigestion thus induced soon passing into inflammation, or into organic changes, if neglected or injudiciously treated.

36. The irritative states of dyspepsia are, however, by no means uncommon in this country, in hot seasons, and even in very cold weather, and during the prevalence of severe or long continued frosts, accompanied by north-easterly winds. They affect chiefly persons of a sanguine and bilious temperament, and of plethoric habit; and in them, especially, are sometimes produced by checked perspiration, by the suppression of accustomed discharges, as of hæmorrhoids, of leucorrhea, of the catamenia, &c., by the drying up of ulcers, and by the repulsion of cutaneous eruptions. They are, however, more commonly occasioned by the abuse of stimulants, as highly-seasoned and rich food, and by addiction to spirituous and intoxicating liquors, and to opium. These states of indigestion are not so often consequent upon errors in diet, as the other forms of the complaint; but they are most frequently met with in the habitual drunkard. They may be induced by change of diet, or change of residence, or climate, and hence their greater prevalence during spring and autumn; by stimulating medicines, as a long continuance of the use of cubebs and copaiba for gonorrhea; by drastic and irritating purgatives; by powerful or repeated emetics; by tonic, stomachic, and aromatic spirits or tinctures, taken in too large doses, or on improper occasions; by hot spices and pickles, particularly cayenne pepper, capsicums, &c.; by the frequent use of mercurial and of heating medicines; by drinking cold and acid fluids after violent exercise, or whilst the body is perspiring; and by various noxious articles, used either as food or drink, or which give rise to incongruous mixtures in the stomach.

37. III. Pathology. — Indigestion manifestly proceeds from the following *conditions* of the sto-

mach and related organs, either of which may be somewhat more prominent than the rest: — 1. Impaired organic nervous power of the stomach. 2. A deficient or disordered state of the gastric juice, or a want of a due relation between the quantity and nature of this fluid and the ingesta. 3. Impaired absorbing power of the stomach, rendering the digestion of the fluid ingesta more or less difficult, and weakening the gastric fluid. 4. Diminished muscular energy of the stomach; the motions and tonic vermicular actions of the organ being weakened, and the admixture of the gastric juice with the ingesta being thereby impeded or delayed.* These pathological conditions may be *primary*, or they may be *consecutive* upon disease of the brain, of

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* As Dr. COMBE observes, the *first* requisite to digestion is an adequate supply of gastric juice, and its thorough admixture with every particle of the food on which it is to operate. The *second* is a steady temperature of about 98° or 100° Fahr. The *third* is the gentle and continued agitation of the alimentary mass in the stomach during the digestive process. — Much light has been thrown upon the function of digestion, and consequently upon disorders of this function, by the experiments of Dr. BEAUMONT, of America, on ST. MARTIN, a strong young Canadian, who was wounded in the left side, a fistulous opening into the stomach remaining without detriment to the general health. For some months after the wound, the food could be retained only by wearing a compress and bandage; but early in winter, a small fold or doubling of the villous coat began to appear, which gradually increased till it filled the aperture and acted as a *valve*, so as completely to prevent any efflux from within, but to admit of being easily pushed back by the finger from without.

Dr. BEAUMONT describes the aperture in ST. MARTIN's stomach as being situated about three inches to the left of the cardia, near the left or superior termination of the great curvature. When the stomach was nearly empty, he was able to examine its cavity, to the depth of five or six inches by artificial distention. When it was entirely empty, the stomach was always contracted on itself, and the valve generally forced through the orifice, together with a portion of the mucous membrane, equal in bulk to a hen's egg. After sleeping for a few hours on the left side, the protruded portion became so much larger, as to spread over the neigbouring integuments five or six inches in circumference, fairly exhibiting the natural rugæ, villous membrane, and mucous coat, lining the gastric cavity. This appearance was almost invariably exhibited in the morning before rising in bed.

The first point which Dr. BEAUMONT conclusively settled is, that the gastric juice does not continue to be secreted between the intervals of digestion, and does not accumulate, to be ready for acting upon the next meal. The next which he established is that in health, the gastric secretion always bears a direct relation to the quantity of aliment naturally required by the system; so that if more than this be taken, there will be too small a supply of the juice for the digestion of the whole. Dr. BEAUMONT further ascertained that the gastric secretion, and the villous coat, undergo great changes during disease. In the course of his attendance on ST. MARTIN, he had opportunities of *seeing* what was actually going on in the organ, and of observing, that whenever a feverish state was induced by obstructed perspiration, or by stimulating liquors, or by overloading the stomach; and that when influenced by fear, anger, or other emotions, depressing or disturbing the nervous system, the villous coat became sometimes red and dry, and at others, pale and moist, having lost its smooth and healthy appearance. As a necessary consequence, the secretions became vitiated, impaired, or suppressed; and the follicles, secreting the mucus which protects the surface of the villous coat, became flaccid, and no longer yielded this bland secretion. The nervous and vascular papillæ thus deprived of their defensive shield were then subjected to undue irritation. When these diseased appearances were considerable, the system sympathised, and dryness of the mouth, thirst, quickened pulse, &c., showed themselves; and no gastric juice could be procured or extracted, even on the application of the usual stimulus of food. The dry, irritated appearance of the villous coat, and the absence of the healthy gastric secretion in the febrile state, as Dr. COMBE has remarked, not only explain at once the want of appetite, nausea, and uneasiness generally felt in the region of the stomach; but also show the folly of attempting to sustain strength, by forcing the patient to eat, when the food cannot be digested, and when nature instinctively refuses to receive it.

The inferences, drawn from the experiments and observations of Dr. BEAUMONT and others, that more immediately concern the subject under consideration, may be stated as follows: —

1. That the processes of *mastication, insalivation* and *deglutition* are important, not merely as subjecting the food to the gastric juice in a state of due preparation for its action, but also as allowing time for the regular contraction of the stomach upon each individual morsel conveyed into it, as well as transmitting the food in small portions at a time, so as to prevent a too rapid or excessive, and injurious distention of the organ. —

2. That the gastric juice is the agent of chymifaction; that it is secreted from vessels distinct from the mucous follicles; that it is a clear transparent fluid, without odour, a little salt, and perceptibly acid; and that it contains free hydrochloric acid, a little acetic acid, and some other active chemical principles. —

3. That this juice is never found free in the stomach, but is always excited to discharge itself by food or other irritants; that it is seldom obtained pure, but generally mixed with mucus, and sometimes with saliva; and that, when pure, it is capable of being kept for months, or even years. —

4. That it is a solvent of food, and alters its properties; that it checks the progress of putrefaction, corrects putrid substances, coagulates albumen and milk, and afterwards dissolves the coagula; and that it commences its action on food as soon as it comes in contact with it. —

5. That it is capable of combining with a certain fixed *quantity* of food; and when more is presented for its action than it will dissolve, indigestion will ensue; and that its action is facilitated by the warmth and motions of the stomach, these motions taking place chiefly in two directions, transversely and longitudinally. —

6. That the gastric juice is modified in quantity, and probably in its intimate constitution, so as to suit the kind of food; and hence the occurrence of indigestion on sudden alterations of the kinds, quality, and quantity of food.

7. That the action of the stomach and of its fluids is the same on all kinds of diet: and that the motions of the stomach produce a constant admixture of food and gastric juice, and thereby facilitate digestion. —

8. That *solid* food, of a certain texture, is easier of digestion than *fluid;* that *animal* and *farinaceous* aliments are more digestable than *vegetable;* but that susceptibility of digestion does not depend altogether upon natural or chemical distinctions. —

9. That digestion is facilitated by *minuteness of division* and *tenderness of fibre*, and retarded by opposite qualities. —

10. That the ultimate principles of aliment are always the same, from whatever food they may be obtained. —

11. That chyme is homogeneous, but variable in its colour and consistence; and that, towards the latter stages of chymification, it becomes more acid and stimulating, and passes more rapidly from the stomach. —

12. That soups and other liquid food do not call into play the muscular coat of the stomach; and before the gastric juice can act upon them, the fluid part must be absorbed and the mass thickened to a proper consistence for undergoing the usual churning motion; and, consequently that this kind of food often gives rise to acidity, particularly in weak states of the stomach. —

13. That, owing to the adaptation of the gastric juice to the nature of the food, sudden or extreme changes from one kind of diet to another is injurious; for the stomach has not had time to modify its secretions sufficiently to meet the altered demand upon its powers. —

14. That water, ardent spirits, and most other fluids, are not affected by the gastric juice, but pass from the stomach soon after they have been received; that heating condiments are injurious to the healthy stomach; and that the use of spirits always causes disease of this organ, if persevered in. —

15. That bulk, as well as nutriment, is necessary to articles of diet; and that digestibility does not depend upon the quantity of nutrient principles that aliments contain. —

16. That the quantity of food generally taken is more than the wants of the system require; and that such excess, if persevered in, generally produces functional disorder, and consecutively, organic disease. —

17. That oily food is difficult of digestion, though it contains a large proportion of nutrient principles.

18. That *bile* is not usually found in the stomach, and is not necessary for the digestion of food; but that, when oily food is used, it assists digestion. —

19. That gentle exercise facilitates digestion; and that the *acetic, citric,* and *hydrochloric* acids promote this process, particularly if vegetables and indigestible subsances have been taken. —

20. That the time required for the stomachic digestion

the liver, of the intestines, of the heart, of the kidneys, or of any other organ; or they may be part only of some more general malady. Dyspepsia may thus be *idiopathic* or *symptomatic*. As presented to the physician in practice, indigestion is generally owing to the above conditions, in connection with the following: — 1. Deficiency, as to quality and quantity, of the fluids derived from the liver, pancreas, and intestinal mucous membrane. 2. Disorder of the circulation and functions of this membrane; and 3. Disorder of the consecutive and harmonious actions of the muscular coat of the small and large intestines.

38. IV. TREATMENT. — There are few diseases which require greater attention to its causes, and to its various states during the treatment, than this. The *objects* of the practitioner are: — 1. To ascertain the predisposing and exciting causes; 2. To draw a rational inference as to the pathological states on which the complaint depends; and 3. To examine into its associations, and to attend to the nature and relation of its complications, whether primary or consecutive. Guided by these *general intentions*, the more *special indications* are: — 1. To avoid the causes; 2. To give immediate relief to the more urgent symptoms, as acidity, cardialgia, flatulence, pain, costiveness, &c.; 3. To remove the pathological states and their consequences; and 4. To prevent a return of the disorder. These indications require to be fulfilled by means appropriate to the particular form of the complaint.

39. i. *Treatment of the Asthenic Form of Dyspepsia. A. In the more acute states*, it is sometimes necessary to remove the load by which the stomach is oppressed, or the substance by which it is irritated, by an *emetic*. But, unless when it is obvious that the disorder depends upon this cause, emetics are injurious, particularly a repetition of them. In such circumstances, the effect is soon produced by irritating the fauces by a feather, or with the finger; by a warm infusion of chamomile flowers; by tepid water, with common salt, or with an aperient salt, and by ipecacuanha. When pallor of the countenance, nausea, oppression, and the sense of a load at the epigastrium, and rancid or bitter eructations are present, emetics are indicated; and these are the most suitable means. But after the organ is evacuated, its functions should be restored by repose, and by small quantities of seltzer water, of iced water, or a cooling aromatic water, as spearmint, &c. Food should not be given till the appetite returns, when the lighter and more palatable articles may be taken. The bowels afterwards require to be evacuated, either by stomachic aperients, as rhubarb, with magnesia or soda, in an aromatic water, or aloes with an alkali, as in the compound decoction, or by enemata. Most of the means recommended in the article CONSTIPATION (§ 15. *et seq.*), and in several of the Formulæ of the *Appendix*, will likewise be appropriate in these circumstances.

40. When *nausea* continues after the stomach and bowels have been evacuated, or when the *vomiting* is protracted after offending matters are removed, medicines to relieve these symptoms should be prescribed, especially the *hydrocyanic acid*, in camphor julep, with a little compound spirit of lavender, or tincture of cardamoms, or a drop or two of *kreosote*, in the form of a pill, with powdered liquorice root. Effervescing draughts, with citric acid and ammonia, this last being somewhat in excess; or the liquor ammoniæ acetatis, with camphor mixture, or with spearmint water; or calcined magnesia, in this or in any other aromatic water, will also be serviceable. If these fail of affording relief, active purgative enemata will generally be efficacious, the symptoms disappearing as soon as a free action of the bowels is procured.

41. *Heartburn* is best treated by medicines, which act upon the secretions, and move the bowels. Rhubarb, with magnesia, and sesqui-carbonate of ammonia, in an aromatic water; blue pill, with castile soap; and alkaline solutions in bitter tonic infusions, or in lime water, are commonly employed, and are most useful when this symptom is connected with acidity. But when heartburn is attended by rancid, septic, or insipid eructations, the mineral acids, as the nitric, the hydrochloric, and the aromatic sulphuric acids, given in simple camphor, or aromatic water, or in suitable tonic infusions, will be most serviceable. Dr. PEMBERTON advises lemon-juice in these cases, and Dr. TODD, the phosphoric acid. When there is a liability to heartburn, wine, spirits, and particularly malt liquors, should be avoided. Hock or old sherry may, however, be taken in great moderation, in seltzer water.

42. *Pain*, or the slighter states of morbid sensibility, will be best removed by the *trisnitrate of bismuth*, conjoined with extract of *hop*, or extract of *hyoscyamus*; by *hydrocyanic acid* or *kreosote*, as directed above (§. 40.); by other anodynes, given with aromatics and antispasmodics; by the compound or fœtid spirit of ammonia, in suitable vehicles; by the compound galbanum pill, or the compound rhubarb pill, with henbane and ipecacuanha; by draughts of warm water, either alone, or with an alkali, or with magnesia. If pain be severe, and if *vomiting* have come on spontaneously, and continued after morbid matters are removed, a full dose of *opium*, with an aromatic, or of the acetate or hydrochlorate of morphia, similarly combined, should be prescribed. But the propriety and frequency of repeating it will depend upon the circumstances of the case. If *fla-*

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depends upon the quantity and kind of food, and upon the state of the stomach; that the time required for the disposal of a moderate meal, in a healthy state of the organ, varies from three hours to three hours and a half or four hours; and that in states of indigestion, the process is delayed much longer than this, particularly as respects the more indigestible substances. —

21. That a diminution of the temperature of the stomach below 98° impedes digestion: and that the temperature of the organ is not necessarily elevated by the process. —

22. That whatever promotes organic nervous power, without exhausting it, favours digestion, as breathing a dry pure air, hilarity of mind, moderate laughter, &c. —

23. That the organic or ganglial nervous influence is more concerned in the process of digestion, than the influence conveyed to the stomach by the eighth pair of nerves; and that the circulating, absorbing, and especially the secreting functions of the organ are under the dominion of the former, whilst the sensibility and muscular contractions are directed by the latter. —

24. That the inference drawn by Dr. W. PHILIP from his experiments, as to digestion depending upon the influence of the eighth pair of nerves, and as to galvanism being capable of supplying the place of this influence, are unphilosophical, as they are formed without due consideration of all the circumstances, and as they leave out of the account the shock given to the system by the violent operations performed in these experiments.

tulence is troublesome, the means already advised may be prescribed, or those recommended in that article (§ 15.) may be employed. Friction over the epigastrium, especially with a stimulating liniment, will also give immediate relief from both pain and flatulence. When *headach* is present, the treatment proposed for *Dyspeptic* HEADACH (§ 46.) should be directed. For the *costiveness* so generally attendant upon this form of indigestion, the medicines already noticed, or those about to be prescribed, or a combination of mild aperients with tonics, deobstruents and alteratives being given occasionally at night, will prove of great service.

43. After an acute attack of dyspepsia, particularly when occasioned by errors of diet, it is necessary to enjoin abstinence, and thus afford the stomach time for repose, until its organic sensibility and functions begin to return. After a while, a cup-full of mutton or veal broth, or of green tea, or of coffee without milk, may be given and repeated ; or a wine-glass full of port-wine negus may, in some cases, be allowed. But care should be taken in returning to a full diet ; and the injunctions as to diet about to be stated ought to receive attention. In general, tonics and stomachics should not be prescribed until the functions of the stomach are returning.

44. *B.* Having removed the more acute attack of asthenic dyspepsia, with its urgent symptoms, the remaining disorder is in all respects the same as the more *slight and chronic states of the complaint*, and requires a similar treatment to them. The *third intention* of cure (§ 38.) should now be carried into effect ; and the organic nervous energy, the secretions, and the muscular tone of the stomach be improved. This intention is to be effected chiefly by the *diet* and *regimen* hereafter to be noticed ; but a judicious recourse to medicine will also prove of great benefit. The infusion of cinchona, of columba, of gentian, chamomile, cusparia, cascarilla, will be severally useful, with the alkaline carbonates, and small doses of stomachic tinctures. Afterwards the metallic tonics, as the tincture of the sesquichloride of iron, the sulphate of iron, the sulphate of zinc, the trisnitrate of bismuth, and the mineral acids, will generally be of service. Several of these may be given with the extract or tincture of hop, or of hyoscyamus. Lime water may be taken with aromatics, particularly when the bowels are much relaxed ; and the aërated, or alkaline chalybeate waters may be used. When there is no complication contra-indicating cold bathing or the shower bath, it will be advantageous to resort to them frequently ; and when uneasiness at the epigastrium is often felt, a warm plaster will be worn in this situation with benefit.

45. The most active or varied means employed to restore the functions of the stomach will be frequently inefficacious, if the offices of the collatitious viscera be imperfectly performed. The *biliary secretion* should therefore be promoted or corrected by occasional doses of blue pill, or Plummer's pill with soap : and the bowels preserved moderately open by mild purgatives, or by a combination of them with bitters and tonics. With this view, rhubarb may be conjoined with aloes, guaiacum, and ipecacuanha, or with magnesia ; the infusion of senna, with the infusion of gentian ; the compound decoction of aloes, with the decoction or extract of taraxacum ; the sulphate of potash with rhubarb ; the purified extract of aloes with castile soap, &c. — These and other mild purgatives may be taken in other combinations, as draughts, mixtures, or pills, as prescribed in numerous and various forms in the *Appendix*, and in the article CONSTIPATION. A judicious combination of bitters with mild purgatives, as, of sulphate of quinine, or inspissated oxgall with aloes (F. 562. 575.) ; the infusion of senna with any of the bitter infusions (F. 266.) ; and the decoction of aloes, with soda and infusion of columba, will generally be extremely useful in this state of the complaint.

46. When chronic asthenic dyspepsia is attended, not only by a torpid state of the liver, but also by incipient cachexia, or has given rise to cutaneous eruptions, &c., much benefit will result from the simple preparations of sarza, with liquor potassæ or Brandish's alkaline solution, and extract of taraxacum. If it have occasioned difficult or impaired menstruation, or a state of incipient chlorosis, as often observed in females in London, the preparations of iron, particularly the mistura ferri composita, the decoction of aloes being taken so as to act freely on the bowels ; or the pilula ferri composita, conjoined either with the pil. aloes cum myrrha, or the pil. aloes composita ; will generally remove all disorder, if sufficiently persisted in, and aided by change of air, diet, and exercise.

47. In this form of dyspepsia, the restoration of the digestive functions much depends upon a healthy state of the other excreting organs, as well as of the bowels. The functions of the kidneys and of the skin should be duly promoted and corrected. The temperature of the general surface, and the exhalations from it, ought to be preserved, and the urine duly examined, in order to ascertain, not only its appearance, but the general character of its chemical constituents. As these vary, or, as certain of them predominate, so should some of the most efficacious medicines, prescribed in the complaint, be varied or altogether changed ; so should tonics be conjoined with alkalies or acids ; and aperients and alteratives be given with absorbents or deobstruents.

48. ii. *The irritative variety of dyspepsia* requires very different means of cure from those just advised ; but the removal of the exciting causes is as necessary in the treatment of it as in that of the foregoing. — *a.* In the more *acute states* of this variety, when pain, tenderness, heat, or soreness is felt in the epigastrium, although the vascular disorder of the villous surface may not amount, it nearly approaches to inflammation ; and erethism, or vascular congestion, at least, exists. The application of *leeches* to the epigastrium then becomes necessary. In plethoric persons, a *bleeding* from the arm should be preferred. In those who have suffered from hœmorrhoids, or obstructions of the liver, *cupping* on the hypochondria, and in females, whose catamenia are deficient, leeches to the groins may be prescribed. Afterwards a large rubefacient plaster, formed either of equal parts of the compound pitch and ammoniacal plasters, or of seven parts of the former with one of the cantharides plaster, should be applied over the epigastrium. The blue pill, or hydrarg. cum cretâ should be taken at bed-time, and a mild aperient in the morning. Fresh castor oil,

assisted by cathartic enemata, will be useful in this variety. In some of the more acute cases, a full dose of calomel, either alone, or with a little James's powder, will be of service. Although calomel, when frequently exhibited, weakens the nervous energy, yet an occasional dose diminishes vascular action in the villous coat of the stomach, and excites the actions of the lower bowels. It should be followed by mild purgatives and active enemata; for by increasing the organic actions of the lower portion, the morbid states of the upper parts of the digestive tube, will the more readily subside. When this variety of dyspepsia is attended by an erythematic *redness*, or *soreness of the fauces and pharynx*, as it frequently is, sometimes extending down along the œsophagus, calomel, taken in the form of powder, aided by mild aperients and active enemata, will be of essential service, not only in acting in the manner just stated, but also in promoting the secretions of the liver and intestinal canal.

49. The other *urgent symptoms*, noticed with reference to the former variety, are generally much more severe in this, and require a somewhat modified treatment. But irritation, erethism, congestion, or even inflammatory action of the villous coat, are not the only pathological states characterising cases of this kind. Organic nervous power, the secretion of the gastric juices, and the tone of the coats of the stomach, are more or less weakened or disordered, and require to be strengthened, as well as corrected. At first, cooling medicines and diaphoretics are required, in order to remove irritation or vascular excitement; but they should afterwards be conjoined with mild tonics or gentle restoratives, and aided by a light farinaceous diet (§ 72.). If *nausea* or *vomiting* occur in this variety, the means already prescribed (§ 40, 41.) will generally remove them.— If they proceed from irritating ingesta, the gentle measures noticed above (§ 39.) will procure their expulsion. Afterwards small doses of the nitrate of potash, and of the solution of the acetate of ammonia, may be taken in camphor water.— When this variety is caused by intemperance, these medicines, aided by abstinence, will prove particularly serviceable. If pain or internal heat is complained of, or if vomiting continues after offending matters are removed, or after vascular depletion has been practised, the warm turpentine epithem, or a mustard poultice, may be applied over the region of the stomach, or one of the liniments above referred to, may be used as an embrocation in the same situation. The anodynes advised for the asthenic variety may also be taken, and cathartic enemata administered, until the bowels are freely evacuated. The medicines already recommended for *heartburn*, and for other unpleasant symptoms, will also be appropriate, after having had recourse to the means just advised.

50. *b.* In the *chronic states* of irritative dyspepsia, local depletions are requisite, only when there is evidence of plethora, or of increased action, or when natural secretions or accustomed evacuations are suppressed. Small doses of mild mercurials at bedtime, the simple preparations of sarza, either alone or with liquor potassæ, and external derivatives, are here extremely beneficial. After the secretions have been improved by these, and the excreting functions restored, the milder tonics conjoined with refrigerants and diaphoretics or anodynes, will be of great service. The decoction of Iceland moss and various other demulcents may be taken with hydrocyanic acid; and a plaster, consisting of either the ammoniacal, the compound pitch, or the compound galbanum plaster, may be worn on the epigastrium. I have generally preferred a plaster, consisting of equal parts of the compound pitch, and of the ammoniaco-mercurial plasters, and prescribed the following: —

No. 262. ℞ Potassæ Nitratis ʒ ss.; Liquor. Ammoniæ Acetatis ℥ i.; Infusi vel Decocti Cinchonæ ℥ iii.; M. Capiat Coch. ii. vel iii. larga bis terve in die.

No. 263. ℞ Potassæ Nitratis ℈ i.; Liquoris Ammoniæ Acetatis ʒ i.; Aquæ Flor. et Infusi. Aurantii Comp. āā ʒ iiss.; Misce. Capiat tertiam partem, ter in die.

No. 264. ℞ Acidi Hydrocyanici, M. ii. Mist. Amygdalæ Dulcis; Aquæ Flor. Aurantii, et Mistur. Camphor. āā ʒ ss.; M. Fiat Haustus ter in die sumendus.

No. 265. ℞ Infusi Lupuli, ℥ ivss.; Acidi Hydrocyanici, M. viii.; Tinct. Aurantii et Tinct. Gentianæ comp., āā ʒ ii.; M. Capiat quartam partem bis terve in die.

No. 266. ℞ Liquoris Potassæ, ʒ iss.; Decocti Sarzæ. ʒ vii.; Extracti Sarzæ, ʒ iss.; Tinctur. Hyoscyami, ʒ i.; Tinct. Aurantii, ʒ iii.; Syrup. Sarzæ, ʒ ii.; M. Fiat Mistura, cujus capiat partem quartam ter quaterve in die.

No. 267. ℞ Infusi Valerianæ, ʒ x.; Acidi Hydrocyanici, ♏ ii.; Sodæ Carbonatis, gr. x.; Tinct. Cardamom. comp., ʒ i.; Spirit. Lavand. comp., ʒ ss; M. Fiat Haustus ter in die sumendus.

51. iii. *Treatment of the earlier consequences of dyspepsia.*—The treatment of several of these is fully discussed in the articles Duodenum, Flatulence, Headach, Hypochondriasis, Pyrosis, and Stomach — *Painful Affections of*. It will therefore be unnecessary to advance much under this head. — *a.* When dyspepsia, in either of its forms, causes frequent attacks of relaxation and soreness of the throat and fauces, or inflammatory redness of these parts with cough, the diet of the patient should be strictly regulated, and mild purgatives, aided by cathartic enemata, prescribed. These attacks should not be neglected in persons presenting any tendency to bronchitis, or to pectoral disease. Some of the severest states of laryngitis and tracheitis have originated in irritative dyspepsia, the symptomatic irritation of the pharynx and fauces extending to the larynx, and exposure to cold, to currents of air, or to other causes, heightening the affection of the respiratory passages. A predisposition to affections of the respiratory organs, or tubercles in a latent state, are then often called into activity by neglected dyspepsia, owing either to symptomatic irritation or to consequent debility. In females, excessive menstruation, as to either the frequency or quantity of the discharge, is often the more immediate consequence, or intervenes between the dyspeptic disorder and the pulmonary affection. In such cases, the treatment should be directed both to the original disorder, and to the consequent affections; and fortunately, much of the means, both medicinal and dietetical, is appropriate to both; the more astringent and refrigerant tonics, and mild or cooling aperients, benefiting the disorder of the stomach as well as the superinduced complaints. To these medicines, ipecacuanha, camphor, and narcotics, will be added with advantage.

52. *b.* The *symptomatic disorder of the heart*, consequent upon one or other of the varieties of dyspepsia, requires chiefly attention to the original complaint. When palpitation is frequent, or the pulse intermittent, after the bowels have been

freely evacuated, and the secretions improved, camphor and ipecacuanha with hyoscyamus, — the sulphate of iron with extract of hop,—the decoction of senega with orange-flower water, or infusion of orange peel, and hydrocyanic acid, — the infusion of valerian similarly combined,— the nitrate of silver triturated with the extract of henbane, or of hop, will severally afford relief. In the irritative states of dyspepsia, particularly if signs of congestion, erethism, or inflammatory irritation, of the villous coat be present, the treatment advised above for this state ought to be premised. At the same time, some one of the warm plasters already prescribed may be applied to the epigastrium. In 1820 I first employed the *nitrate of silver*, combined with narcotics, for a case of dyspeptic palpitation, commencing with half a grain thrice daily, and increasing the dose to one grain. This patient, and others similarly affected, for whom I have ordered this medicine, perfectly recovered. Dr. J. JOHNSON has strongly recommended the nitrate of silver in dyspepsia; and certainly few medicines are more deserving adoption, when the patient is not alarmed at its use. It should, however, be very cautiously employed. This writer also insists much upon the use of the *sulphate of quinine* in most dyspeptic cases. In small doses, with sulphuric acid, in infusion of roses, it is an excellent medicine at that stage of the treatment when active tonics should be prescribed, especially when much debility is complained of. In order to prevent its constipating effects, it may be given with small doses of the purified extract of aloes, or with the aloes and myrrh pill; and when palpitations and other nervous symptoms exist, camphor and hyoscyamus will be added to them with great benefit. In females who have long laboured under dyspepsia, the quinine taken in solution is very serviceable when the catamenia are too abundant; but in other circumstances, particularly when a *chlorotic* state of the system, and impaired or obstructed menstruation have supervened, the *sulphate of iron* with the aloetic preparations should be preferred.

53. *c.* Of all the consequences of protracted and irritative dyspepsia, *disorder of the biliary functions and disease of the liver*, are the most common. When evidence of congestion, or fulness, or tenderness in the region of the liver exists, then the treatment should be commenced with general or local depletions—with cupping on the hypochondrium, or near the right shoulder-blade, or with the application of a number of leeches near the epigastrium, or around the anus. Small doses of blue pill, or of calomel, ought to be taken occasionally at bedtime, and to be followed by saline aperients in the morning. Alterative medicines consisting chiefly of the alkaline carbonates, or of the liquor potassæ, should be given daily, with taraxacum, sarzæ, and such of the other remedies above recommended, as may be appropriate to the case; but the treatment of this complication is fully discussed in the articles GALL-BLADDER and DUCTS, JAUNDICE and LIVER.

54. *d. Cutaneous eruptions*, both acute and chronic, frequently are associated with the more protracted states of dyspepsia, and are often consequences of these states. Yet they are seldom referred to these sources, or to these conditions of the villous surface of the stomach, of the digestive mucous surface generally, and of the biliary and other excreting functions with which they are so intimately connected. In numerous instances, heating, stimulating, and irritating medicines are prescribed, either prematurely, or at a time or stage of the treatment of these eruptions, when local or general depletions, refrigerants, evacuants, alteratives, and a low cooling diet, ought to have been employed. This remark is applicable also to those early indications of biliary disorder, of affections of the kidneys and urinary bladder, and especially of gout, which so often appear in the course of chronic indigestion.

55. OF THE DIET AND REGIMEN IN DYSPEPSIA. Unless the *diet* of the dyspeptic be duly regulated, medical means will be employed in vain. On the subject of diet with reference to indigestion, Dr. PARIS, Dr. A. COMBE, Dr. ROBERTSON, Dr. TICKNOR, Dr. T. J. TODD, and Mr. MAYO, have furnished much information of the best kind, and conveyed it in the most agreeable manner. It is impossible to adduce any thing on this topic which has not been already stated and illustrated by these able writers.—i. *In considering diet with reference to indigestion generally*, there are various circumstances requiring particular notice: 1st, The kinds and quality of the food; 2d, The quantity and congruity of the food; 3d, The times of eating, or the periods which should intervene between meals; 4th, The kind and quantity of drinks; and 5th, The conditions deserving notice in connection with eating and drinking.

56. *A. The kinds and quality of food.*—*a.* Dr. COMBE justly remarks, that a direct relation ought always to subsist between the qualities of the food and the nature of the constitution which it is intended to support. The highly concentrated and stimulating food necessary for the support of those who take very active exercise will prove too exciting to the irritable constitution of persons possessed of great activity of the brain and nervous system; and the generous diet, which suffices to rouse or support a phlegmatic system, will prove too nutritive for a person of a florid and sanguine temperament. For persons of a florid complexion, with great activity of the circulation, and a consequent liability to inflammatory diseases, the food ought to be calculated to sooth rather than to stimulate. Red meat, spices, wines, and fermented liquors, ought to be used sparingly, and the principal support derived from soups, fish, mucilaginous vegetables, acidulous fruits, and diluting drinks. In lymphatic persons, on the other hand, where the circulation is weak and slow, and the functions feeble, benefit is derived from a larger proportion of animal food, while vegetables, soups, and fluids, prove relaxing. To these persons, wine in moderation and spices are useful, if much exercise be taken. Persons of a highly nervous temperament, of great excitability and sensibility to impressions, are injured by heating or stimulating diet. White meats, as fowl and fish, farinaceous and mucilaginous aliments, and ripe fruits, are most appropriate to them. Where the bilious temperament predominates, and much active exercise is taken in the open air, a full supply of animal food is necessary, and a moderate allowance of wine or other stimulus is borne with less detriment, if not with more advantage, than in the sanguine and nervous temperaments. Where the constitution is of a mixed nature, a diet composed of animal and

vegetable substances in nearly equal proportions is, under ordinary circumstances, the best. — The food, also, should be adapted to the age, state of health, and mode of life of the individual, and to the climate and season of the year. A diet which would be quite sufficient to a person of sedentary occupations, would be inadequate to support an individual subjected to frequent or constant exertion; and in warm climates and seasons, a smaller supply of food, particularly of a heating or stimulating kind, is necessary, than in cold and temperate countries. In the former but little animal food is requisite; in the latter, especially in very cold regions and in rigorous seasons, an abundant supply of this kind of diet becomes indispensable.

57. *b.* Although there are few articles of diet which a healthy person, leading a sufficiently active life, may not eat with impunity, there are many which ought to be preferred, and others which should be avoided, by the dyspeptic. *Vegetables* are slower of digestion than animal and farinaceous aliments, and more liable to undergo the acetous fermentation in weak stomachs, and to occasion acidity and flatulence. Fat and oily meats are also very indigestible, and give rise to acid or rancid eructations and heartburn. Soups and liquid food are acted upon by the stomach with great difficulty; and, if the diet consist chiefly of them, they furnish insufficient nourishment, and never fail of producing the more severe forms of dyspepsia, and the diseases of debility. Soups are hurtful when taken at the commencement of a full meal; but when little or no animal food is eaten along with them, and rice or bread is taken with them, so as to promote their consistency, they are digested with greater ease. Pastry, puddings, rich cakes, and articles containing fatty or oily matter, are the most indigestible of all kinds of food. Plain well-cooked animal food, particularly venison and game, kept a due time after it has been killed, and eaten in moderate quantity, with bread, or with roasted, mashed, or dry mealy potatoes, or with rice, is one of the most digestible meals that can be taken by the dyspeptic. The kind, however, of animal food, and the modes of dressing it, should depend much upon the state of disorder, and the age and constitution of the patient.

58. *c. Fish* holds an intermediate rank between the flesh of warm-blooded animals and vegetable food, as respects digestibility. It is less nutritious than mutton or beef; and a larger quantity is requisite to satisfy the appetite. Whiting, haddock, and skate, are the most digestible of salt-water, and perch of fresh-water fish. Gurnard, cod, soles, and turbot, are successively richer and heavier, but easier of digestion than mackerel, herrings, eels, or salmon. Eels are, however, more digestible when they are stewed. Salmon is very indigestible, as usually obtained from the London fishmongers, for the reasons stated in the article Disease (§ 46.); but it is not indigestible when quite fresh and properly cooked. The same observation applies to mackerel and herrings. Fish is most digestible when *boiled*; it is less so when *broiled*; and the least so when *fried*. The dyspeptic should eat it dressed only in the first of these ways. Shell-fish is slow of digestion; some much more than others. Raw oysters are more digestible than crabs or lobsters; but oysters, when stewed or otherwise cooked, are heavier than either. Fish is often rendered indigestible by the sauces, &c., taken with it. Vinegar, however, and lemon-juice promote the digestion of it. Malt liquor ought not to be drank with fish. Fruit should not be eaten with it; and milk, likewise, should be avoided.

59. *B.* The *quantity of food* should always be proportioned to the digestive powers of the stomach and the wants of the system. Where waste is great, and growth active, an abundant supply of food is requisite, and the desire for it is commensurate with the demand. Those who lead sedentary lives, and whose circumstances admit of free living, are peculiarly liable to dyspeptic complaints, owing chiefly to the quantity of food indulged in. It is indispensable to a due and natural supply of aliment to the stomach, that attention be paid to the preliminary processes of mastication and deglutition. If these be performed too hastily, too much food will be received in a short time, in a state of insufficient preparation, and the stomach will be overloaded, before the sensation of hunger can be completely allayed. As the dilatation of the stomach by the ingesta, should be gradual, and ought not to exceed a certain limit, and as a definite quantity of gastric juice is secreted, according to the wants of the system and the habits of the individual, if more than the usual quantity of food be taken, the organ will be over distended and a part of it will remain undissolved, producing the usual symptoms of indigestion. Such being the case even with the healthy, how much greater will be the disorder when excesses are committed by the dyspeptic. Sir F. Head very justly remarks, "that almost every malady to which the human frame is liable is, either by high-ways or by-ways, connected with the stomach; and I must own, I never see a fashionable physician mysteriously counting the pulse of a plethoric patient, or, with a silver spoon on his tongue, importantly looking down his red inflamed gullet, but I feel a desire to exclaim, 'Why not tell the poor gentleman at once — Sir, you 've eaten too much, you 've drunk too much, and you 've not taken exercise enough!'" — Dr. Abercrombie observes "when we consider the manner in which diet is generally conducted in regard to the quantity and variety of food and drink, instead of being astonished at the prevalence of indigestion, the wonder should be that any stomach, having such duties imposed on it, is capable of digesting at all." Much, certainly, is to be done in dyspepsia, by attention to the quality of the articles of food, but *much more depends upon the quantity*. Indeed the dyspeptic might almost be independent of attention to the former, if he rigidly observed the latter. This opinion is supported by the experiments of Dr. Beaumont, showing that the power of digestion is limited by the amount of gastric juice provided by the stomach — an amount varying with the modes of life and the wants of the system. It is superfluous to remark that second courses, served up to gratify the pride of the host, overcome the stomach, paralyse digestion, and occasion acute attacks of indigestion.

60. It is impossible to assign any rules respecting the quantity of food that should be taken, as it depends upon so many circumstances. Mixtures of different kinds of food are injurious to digestion,

chiefly by the inducement to excess in quantity, which the variety affords, and by the incongruity of many of the articles. When only one dish is partaken of, Dr. Combe remarks, there is less temptation to exceed the quantity, than when several are tried. The first intimations of a satisfied appetite, are warnings to stop eating, which should never be neglected by dyspeptics. If these be passed by, indigestion or an aggravation of it, where it is already present, will always result. The quantity of food should also have reference to the amount of exercise. When little or no waste is excited by exercise, the supply should be remarkably moderate, as well as digestible. Persons who have removed from the country, where they have enjoyed active exercise in the open air, and have consequently digested well a full diet, generally become dyspeptic when they have removed to large towns, and are subjected to very different circumstances, especially if they continue the same quantity of food, or if they increase it.

61. *C.* The *times of eating*. In general, five or six hours should elapse between one meal and another. Even in healthy persons, digestion of a full meal is seldom over in less than four hours; and in dyspeptics, it is seldom disposed of until a much longer period has passed. The stomach, also, requires an interval of rest after the process is finished, in order to enable it to enter upon the vigorous digestion of the next meal. If food be taken before the organ has recovered itself from its previous exertion, the secretion of the gastric juices, and the muscular contractions, will be imperfect. The whole of the gastric juice which the stomach can secrete in a given time being engaged in the digestion of the first meal, the one taken too closely upon it will be insufficiently acted upon, and thereby undergo fermentation. The intervals between meals should be in relation to the quantity eaten, and the habits of the individual as to air and exercise. When the latter are enjoyed, the periods may be much shorter than when the habits are sedentary.

62. For dyspeptics, as well as for healthy persons, the meals should be regulated according to the necessary occupations and habits of the individual. For those, observes Dr. Combe, who work by day and sleep by night, an early breakfast, an early dinner, and an early evening meal, will be most conducive to health. But for those who, against the laws of nature, keep late hours, late breakfasts and dinners are preferable. — Persons who eat suppers ought not to breakfast till one or two hours after rising; but those who dine late and eat nothing afterwards, require breakfast sooner. As a general rule, breakfast about half an hour or an hour after rising will be found most beneficial. Those who are obliged to rise very early, should take a cup of coffee or tea with a biscuit soon after getting up, and a more substantial breakfast about three hours afterwards. If exposure to cold, to the morning dews, or to unwholesome air, or to any other cause of infection be incurred in the morning, the stomach should be fortified by coffee or by breakfast. The dyspeptic, especially, ought never to travel, or to enter upon any exertion with an empty stomach, and never with an overloaded one.

63. As a general rule, not more than five or six hours should elapse from breakfast till dinner. For youth and convalescents, and for persons taking active exercise in the open air, the interval may be somewhat shortened; but for sedentary persons, it may be much prolonged. Much, however, should depend upon the appetite, which ought to have returned some time before dinner is taken. According to this, the most suitable time for this meal, is about two o'clock. As many dyspeptics as well as others cannot dine until much later in the day, ought nothing to be taken till five, six, or seven o'clock? or ought a light repast to be taken at one or two o'clock, and the appetite be chiefly reserved for a substantial meal at a much later hour? When dinner cannot be taken until eight or nine hours after breakfast, it will be necessary to have some refreshment in the meantime; but it should be in relation to the time that will elapse until dinner, and to the exercise taken. For persons of sedentary habits, a biscuit and a glass of water will be sufficient; but for the active and the young, especially if the interval be long, a more substantial luncheon is necessary. The habit of resorting to pastry-cooks for refreshment, and of taking wine with it, is generally prejudicial, and particularly in dyspepsia. When dinner cannot be taken until a late hour, it should always be postponed for half an hour or an hour, until excitement or fatigue has subsided.

64. When the dinner is early — from one to three o'clock — a light meal of tea or coffee and bread is necessary; but when the dinner is late, or little exercise is taken after it, tea or coffee should be used merely as a diluent, and no food ought to be eaten. After an early dinner, admitting of time for its digestion and a return of the appetite before a late hour, a third meal, of light aliments, and in moderate quantity, should be taken, particularly by persons engaged in the open air. When ultra-temperance is practised by the dyspeptic, particularly when he lives actively, and retires to bed with an entirely empty stomach, he is quite as likely to have disturbed sleep and unpleasant dreams, as if he had his stomach loaded. He may even be wakeful and irritable, or experience a sense of unpleasant emptiness or gnawing at the stomach. All these may be removed by a basin of arrow-root or sago, about an hour before bedtime. A light supper may therefore be taken, when the dinner is early; but it should be at least an hour or two before retiring to rest.

65. *D.* The dyspeptic, as well as other valetudinarians, inquire, *What ought we to drink?* but they rarely follow the question by the next important one, *When should we drink?* And they never inquire as to *the temperature at which fluid should be taken*. *a.* Respecting the *first* of these questions, it may be stated, that *water* — either spring water, or toast-water, is the safest if it be taken only according to the dictates of thirst. Whey, fresh small beer, soda water, and seltzer water, are of service in many cases, as will be noticed hereafter; but fermented liquors and wines require greater restrictions. The young dyspeptic ought never to drink any thing but water, toast-water, or whey. The more stimulating beverages will be prejudicial to him, unless during states of debility, for which it may be necessary to prescribe them medicinally. Of all these, spirituous liquors are the most injurious, and ought never to be taken in any form, nor in any variety of indigestion. Some of the asthenic states of the complaint, which are benefited by a moderate

use of wine, are exasperated by spirits, or even by malt liquors. Dr. Beaumont found on examining St. Martin's stomach, after a free indulgence in ardent spirits for several days, the villous surface covered with erythematic and aphthous patches, the secretions vitiated, and the gastric juice diminished in quantity, viscid, and unhealthy, although he complained of nothing, not even of impaired appetite. Two days later, when matters were aggravated, the erythematic appearance was more extensive, the spots more livid, and from the surface of some of them, small drops of grumous blood exuded. The apthous patches were larger and more numerous, the mucous covering thicker than usual, and the gastric secretions much more vitiated. The fluids, extracted from the organ, were mixed with much thicker ropy mucus and muco-purulent discharges, slightly tinged with blood. Yet St. Martin complained only of an uneasy sensation, and a tenderness at the pit of the stomach, with vertigo and dimness of vision on stooping. The tongue was covered with a yellowish brown coating, and the countenance was somewhat sallow. After a few days of low diet with mild diluents, the inner surface of the stomach assumed its healthy state, the gastric juice became clear and abundant, the secretions natural, and the appetite voracious. Dr. Beaumont adds, that the free use of ardent spirits, wine, beer, or any intoxicating liquor, when continued for some days, invariably produced these morbid states. Eating voraciously or to excess, and swallowing food imperfectly masticated, or too fast, produced the same effects when repeated frequently in close succession. (*Exper. and Observ. &c.* p. 237.). He often observed that, when stomachic disorder, with febrile symptoms, was present, or when influenced by violent mental emotions, the villous coat of the stomach became red, irritable, and dry; and that but little gastric juice was secreted on the food being taken, digestion being very much prolonged. No more wine, therefore, nor more of any other fermented liquor, should be taken, than may be found sufficient to support the strength and ameliorate the symptoms of the dyspeptic, without quickening the circulation.

66. *b.* As a general rule, the *desire for fluids* is the chief indication of *the time* at which they ought to be taken; but large draughts should be avoided, as the stomach becomes suddenly distended, the juices diluted, and the muscular coat weakened by them. Besides, much more fluid may be thus taken than is necessary for the wants of the system. The dyspeptic ought never to drink largely, either during, or soon after, a meal. Frequent sipping, or drinking by mouthfuls, will be much more beneficial, and ultimately, more quenching of thirst. Mild drinks are best taken about three or four hours after a solid meal. It is then that tea and coffee are used as beverages. These are always injurious when made too strong, or taken in large quantity, especially to the dyspeptic. Soda water drank at the time of dinner is hurtful, by distending and over exciting the stomach. Seltzer water is less so; but it is often of service some time after a meal, when there is much thirst. Soda water is then sometimes also of use.

67. *c.* The *temperature at which fluids should be taken* is of the utmost importance to the dyspeptic. *Extremes* of temperature are injurious even to the healthy, and not only to the stomach but also to the collatitious viscera, and to the teeth. The bad effects of the ingestion of large quantities of cold water into the stomach have been often demonstrated; but the subject has been very superficially considered. Dr. Beaumont remarked, that a gill of water, at the temperature of 55°, received into St. Martin's stomach when empty, reduced the heat of the organ from 99° to 70°, at which it stood for a few minutes, and then rose very slowly. This experiment explains the injurious effects produced upon weak stomachs by cold fluids taken during digestion, and the fatal effects of very copious draughts of cold water whilst the body is fatigued and perspiring; the shock which the constitution receives from having the temperature of the most vital and central organ suddenly and remarkably depressed, paralysing the other vital movements. It having been demonstrated, that a temperature of 98° is requisite to healthy digestion, it must follow, that the use of ices, and particularly iced creams after dinner, or when digestion is proceeding, will be most injurious. A fit of indigestion is often caused by them; and they seldom fail of lowering the vital tone of the stomach during the digestive process. The moderate use, however, of cold or iced water, or of water ices, when this process is completed, and when there is no exhaustion, is beneficial, by inducing a salutary reaction in the organ. Ices can be only taken slowly, and in small quantities at a time; hence they produce a much less sudden fall of temperature of the stomach than draughts of cold fluids. Dr. Dunglison states, that labourers in Virginia were frequently killed by drinking copiously of spring water when over-heated; but that such accidents have rarely occurred since they have been supplied with ice. The proper temperature at which soups, tea, coffee, chocolate, &c., should be taken, may be stated at about 100°; and at this grade of heat, liquids will be found more quenching to thirst than at a higher or lower temperature.

68. *E.* The *conditions necessary to promote a healthy digestion* require a brief notice. The determination of the circulating fluids to the digestive mucous surface and collatitious viscera, and the copious secretion from these viscera during digestion, require that the function should not be disturbed by moral or physical perturbation or exertion. Rest of body and tranquillity of mind for a short time before and after, but particularly after eating, is hence conducive to digestion. Whatever derives the nervous energy and the circulating fluids from the digestive viscera, or causes oppression of these viscera by over-loading the large veins, is injurious during digestion. Hence blood-letting, hot or cold bathing, mental shocks, exertions of any kind, and other circumstances which operate in this way are more or less hurtful. As the quantity of gastric juice requisite to the digestion of a full meal is generally secreted in an hour or an hour and a half after it is taken, or at least within two hours even in the dyspeptic, bodily and mental repose is beneficial during this time. It is thus that a *siesta* after dinner is found so serviceable to the dyspeptic. But, by promoting digestion, it favours supply, diminishes waste, and consequently induces vascular plethora, and the usual consequences of

this state, particularly in respect of the brain and liver. In dyspepsia, the desire for rest after a repast is great in proportion to the quantity eaten, the nervous energy being concentrated in the digestive viscera, in order to dispose of the ingesta. The state of the mind has a powerful influence on digestion: hilarity and ease of mind promote this function; whilst care, anxiety, envy and dissatisfaction, impede it. Dr. Caldwell remarks, that dyspepsia commences perhaps as often in the brain as in the stomach. It is almost exclusively a complaint of the studious, the scheming, the daring adventurer, the stock-jobber, and the speculator, and of those who, over-exerting their brains, thereby injure them.

69. ii. *Of the Diet and Regimen with reference to the different states of Dyspepsia.* The observations of Dr. Todd as to the diet suitable to the different states of dyspepsia, are extremely just and precise; I shall, therefore, avail myself of some of them. *A. During the asthenic forms of indigestion*, the quantity of food should be reduced to the power of disposing of it; such articles as are difficult of digestion and weaken the stomach being altogether withdrawn.—*a.* The patient should be confined to a spare diet of animal food, and to a restricted use of fluids. A bulky meal ought always to be avoided; and when the appetite is impaired, abstinence will be frequently preferable to the use of stomachics. When the appetite does not fail, which is often the case when dyspepsia is produced by mental exertion, the patient should cease eating before the appetite is altogether allayed. The tea or coffee at breakfast should be taken with very little milk and sugar, and very little butter ought to be used. An egg, lightly boiled, may be eaten by those who take sufficient exercise. The dinner should consist of lean animal food, particularly mutton, poultry, game, and venison, which ought to be roasted or broiled. Bulky vegetables should be avoided; but mealy potatoes, yams, or rice, mixed with the gravy of the meat, young summer turnips, cauliflower, or French beans, may be taken sparingly. The least hurtful fruits are strawberries, morel cherries, and mulberries; but they should be eaten as a part of the luncheon, rather than after dinner. Fluids, even when there is thirst, should be taken slowly, and in small quantity, and always after a meal. If the digestion or habit require the stimulus of wine, old sherry or old port, with an equal part of water, should be preferred; but the quantity of either or of both should not exceed two or three glasses. Twice-dressed meat, *rechauffées*, and made dishes, ought not to be eaten; and the food should be masticated slowly and thoroughly.

70. *b.* The *kinds of food* most injurious in this variety of dyspepsia, and therefore to be avoided, are sweet, mucilaginous, or acid fluids, and such as contain much milk; puddings, compound dishes, and meat pies; new bread, or heavy unfermented bread; compact or fat dumplings, and pultaceous articles; creams, curds, custards, cheese, and all preparations of milk; fat meat, particularly pork or bacon, young meat, all gelatinous parts of meat, and salted or smoked meat; the less digestible species of fish, and all shell-fish; strong broths, gelatinous soups, or concentrated dishes; melted butter, oil, sauces, spices, condiments, and pickles; bulky or flatulent vegetables, especially cabbages, waxy potatoes; pot-herbs, beans, peas, cucumbers, &c.; most fruits, whether fresh or preserved; currants, gooseberries, apples, plums, melons, all kinds of nuts or kernels, and preserves or jellies. Malt liquors, particularly ale, perry, cider, home-made wines, punch, and shrub should also be avoided.

71. *c. Regular exercise* ought to be taken in th open air; and the kinds of exercise that bring th greatest number of muscles into moderate action should be preferred. Celsus very justly advises persons subject to stomach complaints, to exercise the upper extremities and parts of the body. There are several amusements which have this effect, especially billiards, fencing, rowing, cricket, &c. For females, singing, dancing, skipping, battledore, dumb-bells, and the exercises recommended by Mr. D. Walker, will be found very serviceable, especially when confined to the house by weather, or when exercise on horseback or on foot cannot be taken.

72. *B.* The *diet and regimen most suited for the irritative states of indigestion* differ considerably from those now recommended. In this variety, bland, farinaceous, and semi-fluid food, in small or moderate quantity, is the most appropriate, until vascular disorder of the villous coat of the stomach is removed by treatment. Saccharine, farinaceous, feculent, mucilaginous, and acidulous articles of food are most easily digested in this condition of the organ. Gentle exercise, as gestation in a carriage or on horseback, sailing, swinging, and walking, is preferable to the more exciting kinds of exercise. After digestion is completed, tepid or warm bathing, and frictions of the surface, are generally beneficial. When vascular excitement is removed, the patient may gradually adopt the diet advised for the preceding variety, beginning with light chicken, mutton, or veal broth, with toast or rice; and afterwards the more digestible kinds of solid food may be used.

73. *C.* The *wines and beverages* best suited for indigestion are old sherry or port diluted with equal parts of water, the finer kinds of claret, hock, white hermitage, and Sauterne; but these should not be taken in the irritative forms of dyspepsia until vascular excitement of the villous coat of the stomach is removed. The diluents most beneficial are seltzer water with a small quantity of hock, or seltzer water with milk or whey, or lime-water with milk or black tea, according to the peculiarities of the case. In the more irritable states of the stomach, whey, goat's whey, small quantities of seltzer water, or the imperial drink, should be preferred. When the state of the urine indicates the impropriety of using vegetable or mineral acids, the alkaline carbonates may be substituted; but, when indigestion has induced a torpid or disordered state of the biliary organs, not connected with inflammation, beverages slightly acidulated with the nitro-hydrochloric acids will be found serviceable.

74. *D. Several mineral waters*, both natural and factitious, are most excellent aids in the treatment of the several forms of indigestion.—*a.* In the *asthenic variety*, the mineral springs of Clifton, Malvern, Bath, and Tunbridge Wells, and the carbonated chalybeate waters of Spa, Pyrmont, Carlsbad, Marienbad, Swelbach, and Eger, on the Continent; or their imitations prepared by Dr. Struve, are generally beneficial.—*b.* In the *irritative states* of dyspepsia, the springs of

Harrowgate, of Ems, Plombières, Vichy, and of Marienbad, or other alkaline mineral waters, will be used with advantage. When the functions of the liver are disordered, the waters of Cheltenham or Leamington, or of the Beulah Spa, and the springs of Seidschutz and Pullna may be preferred; but when excitement of the villous coat of the stomach, and when the functions of the excreting viscera are restored, the aerated chalybeate waters, already mentioned, will be most serviceable.

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INDURATION. — SYNON. *Induratio* (from *Indurare*) to become hard. *Induration*, *Endurcissement*, Fr. *Induramento*, Ital. *Die Härtung; verhürtung*, Germ. *Hardening*.

CLASSIF. — GENERAL PATHOLOGY. — *Morbid structure* — *Therapeutics.*

1. Induration is either *physiological* or *pathological.* The former proceeds — *first*, from the changes which take place in the tissues during the progress of AGE (see that article); and *secondly*, from the increased nutrition and vital cohesion, consequent upon great activity of the vital manifestations of the part. This latter state, however, can hardly be termed induration. The *general pathological relations of induration* only require notice at this place. The specific conditions of it in the different tissues and organs are noticed in the articles on the pathology of these parts.

2. i. Induration may exist in a *simple state*, and unconnected with any apparent deposition of fluid or morbid product. In this case, it is merely a greater density of the natural structure, owing to some change in its nutrition, without any morbid secretion or further lesion of organisation. Various tissues and organs occasionally present this alteration, as the brain, the liver, the muscular structure of the heart, the cellular and fibrous tissues, the bones, the glands, pancreas, ovaries, &c. It may be independent of any change in the size or form of the part; but it is often connected with an increase of size, constituting *hypertrophy with induration.*

3. ii. Induration may depend upon an *infiltration of a fluid or solid matter* into the areolar or peculiar structure of a part — of serum, lymph, albumen, fibrine, or even of blood. The excited, or otherwise altered, action of the capillaries of the part may give rise to the effusion of these matters in a more or less fluid state; but they subsequently undergo various changes as to consistence or even organisation, their watery parts being absorbed, and the albuminous or fibrinous portions becoming more or less changed, or even identified with the structures which they infiltrate, Many of the lesions observed in the cellular tissue and parenchymatous organs — in the lungs, liver, spleen, glands, &c. — are owing to this species of alteration.

4. When the matter thus deposited is of a *peculiar or adventitious nature*, whether pre-existing in the blood, or produced by a change in the vital condition of the part, or of the constitution, the tissues, which are the seat of induration, undergo a succession of changes, and they as well as the matter which infiltrates them, or is deposited in them, assume peculiar forms, as in scirrhus, cancer, &c.

5. iii. Induration may proceed from the *absorption of the more fluid constituents of the tissues.* This seldom occurs, excepting from compression, owing to the effusion of fluid, or the development of morbid structures in their vicinity, or in enveloping parts. Effusions in the pleura and false membranes formed on its surface produce this change in the lungs; and the fibrous or fibro-cartilaginous formations in other situations produce a similar alteration, as in the spleen, &c. This form of induration may often be said to be rather a state of condensation or atrophy with induration. The distension, produced by the accumulation of natural secretions cannot be comprised amongst the forms of induration.

6. iv. Indurated parts *vary in appearance* — in colour, size, and form. 1. The *colour* is generally

changed, being often pale, owing to diminished vascularity and the deposit of albuminous matter; and sometimes red, greyish brown, yellowish, &c. These hues evidently depend upon the vascularity, and the state of stagnant fluids, and of effused or infiltrated matters. 2. The *size* of indurated parts may not be changed; more frequently it is increased, and sometimes it is diminished. 3. The *form* of the indurated part may or may not be altered.

7. v. The *causes* of induration may, in general terms, be stated to be whatever excites the vital actions of the part, or occasions a slight or protracted irritation of its capillaries. Induration from compression, however, cannot be ascribed to these causes. M. ANDRAL remarks that, — 1. Irritation may be the first phenomenon apparent, evidently preceding irritation and continuing with it. — 2. Irritation, having produced induration, may cease, induration alone continuing. — 3. Induration sometimes occurs without any evidence of pre-existing irritation. — 4. At an advanced period of induration, the quantity of blood sent to the part is actually less than before its induration, its vitality being also less than before this change of structure. — 5. In some cases, a secondary irritation may arise, at a longer or shorter period after the formation of induration. This secondary irritation sometimes restores the indurated part to its healthy condition; but more frequently it is productive of the most injurious consequences, causing ulceration, softening, &c.

8. vi. TREATMENT. — Induration in vital organs can seldom be ascertained, so as to enable the physician to enter upon its treatment with much hope of success. Alterations of sensation, motion, and size, sometimes lead to a belief in its existence. When these exist with weight or tension, and marked disturbance of function, vascular depletion, general or local, according to circumstances, derivatives and courses of alteratives, are the chief means upon which reliance can be placed. The alkaline solutions, the preparations of iodine, and mild mercurials, with narcotics, are sometimes useful; and the various modes of deriving irritation to external parts, should not be neglected. But both alteratives, deobstruents, and derivatives, ought to be continued for a sufficient time to test their efficacy. When the indurated part is near the surface, deobstruent plasters, and frictions with discutient liniments, embrocations and fomentations, may be severally employed. In all cases, it is necessary to prevent disorder of the digestive organs, to allay pain and irritation by anodynes, to promote the natural secretions and excretions, and to preserve the constitutional powers by light nourishment and change of air. When induration proceeds from compression, the removal of the compressing cause should be attempted, if circumstances admit of its accomplishment.

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INFECTION. — SYN. From *Inficio. Contagium, Conterges, Contagio* from *con* and *tango*, Lat.; *Infection, Contagion*, Fr.; *Austeckung*, Germ.; *Infezione, Contagione*, Ital. *Contagion.*

CLASSIF. — GENERAL PATHOLOGY — *Etiology.* GENERAL THERAPEUTICS — *Prophylactics.*

1. In the view which I am about to take of infectious agents, of their operation, and of their effects, it will be necessary to premise a few remarks as to the meaning I would attach to the word *infection*, as well as to other terms which have been usually considered as synonymous with it, or as expressing modes of the same agency. By some writers, the words *infection* and *contagion* have been received as altogether synonymous, whilst others have drawn distinctions between them. Few, however, of the latter have agreed on the subject. QUESNAY first attempted to give precision to the application of these terms, but with little success. Since his time the word *infection* has been commonly applied to the communication of disease from the sick to the healthy, by a morbid miasm or exhalation diffused in the air; and the word *contagion* to the transmission of a specific malady by immediate or mediate contact. But it is obvious that these are merely modes of the same agency in the majority of instances; for the humidity of the air becomes a medium of contact in the former, as much as the clothes of the sick are the media of it in the latter, the chief difference being, that the one acts only by being diffused in the air, whilst the other may act either in the same way, or it may directly convey a consistent virus or morbid secretion. In cases where substances have become the media of absorbing and retaining the morbid emanations or the effluvia of specific diseases, and thereby transmitting them, it must not be inferred that the infection is produced by contact of any part of the external surface of the healthy person with the substance thus imbued. The clothes worn by a person whilst labouring under a disease strictly contagious, even according to the above acceptation, may be so imbued with the morbid exhalation as to retain it for a long time, especially if shut up from the air, and may afterwards emit it upon being unfolded and exposed, and thereby propagate the disease to an individual who has never come in contact with the substance which has thus proved the *fomes* of contagion. Instead, therefore, of considering these distinctions as constituting a true difference, it will be preferable to view *contagion* as a *mode* of infection, to which certain limitations should be attached.

2. M. ROCHOUX considers that infectious agents may be divided into those which, like germs, are capable of reproducing and multiplying themselves as organised bodies, and into those which are devoid of this character, and require for their propagation certain accessories, without which they will not appear. The former of these represent contagions, the latter infections. M. DUPUYTREN observes, that *infection* is the contamination of the air by persons confined in low, close, ill-ventilated, and dirty situations, and by vegetable and animal substances undergoing decomposition, the emanations with which the air is thereby charged acting on man as poisonous agents. The sources of these emanations are

active in proportion to the grade of atmospheric humidity and temperature, and to the nature and quantity of the miasms which the air contains. *Contagion*, on the other hand, he considers to be in many respects independent of atmospherical conditions, and a species of germ or virus developed in the bodies of the sick, or forming an atmosphere around them containing the principle of the malady; and through the medium of this germ, virus, or morbid principle, the malady is transmitted to the healthy. When we consider the diverse states and kinds of agents to which the terms infection and contagion have in general been indiscriminately applied, and the close approximation of several of these agents to each other, as respects their properties and effects on the living economy; and when we further consider the modifications each of them experiences in the ever-varying conditions in which they present themselves, and from the several circumstances and accessory influences which are associated with them, the difficulty of assigning to them specific distinctions will be evident. Yet the difficulty should not preclude attempts at distinctions, and at arrangements founded on such distinctions, as a greater precision of knowledge than now exists will, to a certain extent, result even from a partial attainment of these objects, and will be extremely conducive, not only to an acquaintance with the influences by which these agents are modified, and with the changes they effect on the human economy, but also to the suggestion and acquisition of means by which their effects will be prevented, or be counteracted where prevention cannot be accomplished. The chief fault of distinctions drawn between *infection* and *contagion*, and at the arrangement of the various modes and kinds of these agencies, is, that both the one and the other are based upon preconceived and narrow views of their nature and operation, involving, moreover, various opinions by no means consonant with the usual procession of morbid actions. The obvious course, therefore, is to make distinctions only where differences actually exist, applying terms with precision, according either to their received meaning, or to the sense in which it is desired to receive them, and to arrange phenomena according to the relations established by close observation and candid description. In the following remarks I use the word *infection* in its *generic* acceptation, employing it according to the meaning attached to it by Virgil, Ovid, Pliny, and other classical writers of antiquity, and by many modern authors; and applying it to whatever may effect, so as ultimately to *taint, pollute,* or *corrupt the body*. I use also the word *contagion* in the sense imposed on it by Virgil, Pliny, Columella, and Curtius—as an *infection by immediate or mediate contact*—as a *pollution by the touch*. The word *contamination* may with justice be applied to the deterioration or morbid change which takes place in the fluids of the body during the course of infectious maladies. The terms *morbid impression* and *morbid influence* will represent the change first produced, particularly on the nervous system, by the agents of infection. Although the effluvia or emanations from the sick, the secretions formed in the course of infectious diseases, and the putrid fluids in the bodies of the dead, generally act upon the living, when applied in a manner suited to the operation of each, as *animal poisons*, yet I will restrict this term to those agents which are usually thus designated.

3. From this it will appear that the word *infection* is here employed in its most extensive application; and that the words *contagion, contamination, morbid impression,* or *influence*, are used to express the chief modes in which it takes place, and the chief states in which it may exist. Receiving therefore *infection* as the generic appellation, the other terms represent *species* arranged under it. In other words the frame may be infected — 1st, by the *morbid impression* of agents — *internal* or *self-generated*, or *external and mephitic*, the infection being limited to the individual, and incapable of propagating its kind. — 2ndly, by the *contamination* produced by animal effluvia, the infection being capable of propagating itself in certain ascertained circumstances, and of spreading to the healthy from those affected by these agents. 3rdly, by the *morbid impression* or *contamination* of specific emanations and secretions, the infection presenting certain specific effects, or disseminating and perpetuating specific maladies.

4. The various influences and agents, by which the human frame is infected throughout, come under one or other of these modes of operation. They consist chiefly or miasms or exhalations from vegetable matters in a state of decay; of unwholesome or noxious ingesta; of effluvia from dead animal matter; of the emanations from the healthy in confined situations, and from the sick in several diseases, and in the various circumstances favourable to their accumulation or concentration; of septic matters arising from animal decay; and of palpable or more or less consistent secretions. But several infectious agents may be associated in their operation. The miasms or exhalations from decayed vegetable matter, or from the soil, &c. may be conjoined with the effluvia from animal substances. Some of them may act directly, or in the vicinity of their sources only, as those derived from vegetable and animal decay. Others not only operate in this way, but also through the medium of substances which imbibe and retain them in a sufficient quantity to be injurious. They admit however of certain general propositions being stated with respect to them; and of the following arrangement, with reference both to their nature and effects.

a. Infecting agents consist almost entirely of decayed or diseased organised substances, and of animal emanations or secretions.

b. Those agents which proceed from the decay of vegetable substances or principles, although they infect the frame exposed to their sources, are yet incapable, when unaided, of producing those states of action generating a seminium, or morbid principle by which they may be propagated from the sick to the healthy.

c. Organic bodies in a state of decay or disease, and animal secretions, *infect* the human frame chiefly during states of predisposition or susceptibility of the frame, certain only of which states are ascertained.

d. The *morbid actions* produced by infectious agents generally assume specific forms according to the nature of the agent, so that the agent being known, its effects may be predicated; and on the other hand, the nature of the agent may be inferred from the form and characters of the existing effect.

CLASSIFICATION OF INFECTIOUS AGENTS.

Class of Agents.	*Order of Agents.*	*Species of Agents.*	*Diseases resulting therefrom.*
I. Non-disseminating, and non-perpetuating Infections. *Idio-infectants.*	i. *Miasms or mephitic vapours — Endemic Infection — acting through the air.*	1. Miasms from decayed vegetable matter aided by moisture, in temperate ranges of atmospheric heat.	Catarrhal fevers. Rheumatic attacks. Intermittents. Enlargements of the spleen, and torpid states of the liver.
		2. Exhalations from absorbent, or deep, exuberant, or marshy soils, suspended in atmospheric humidity at temperate grades of warmth.	Intermittents. Remittents. Simple dysentery. Simple cholera. Bilious fevers. Obstructions and other diseases of the liver and glandular organs.
		3. Miasms or vapours from decayed vegetable matter, or from marshes and rich, deep, and humid soils, at high ranges of temperature.	Inflammatory, bilious, and gastric fevers of both a remittent and continued type. Diseases chiefly of the abdominal viscera.
	ii. *Unwholesome and poisonous ingesta* — Infections occasionally epidemic.	Unripe, diseased, or decayed grain. Diseased or putrid fish or flesh. Water containing putrid animal matters, &c. &c. &c.	Ergotism. Gangrenous ergotism. Asthenic and chronic diarrhœa. Dysentery. Scurvy and scorbutic dysentery. Mucous, gastric and putro-adynamic fevers.
	iii. *Self contaminating agents*, or morbid matters formed in a part, afterwards contaminating the system generally.	1. Cancer. Fungo-hæmatoid disease, &c.	The carcinomatous and fungo-hæmatoid cachexy.
		2. Purulent, sanious, or other morbid secretions carried into the circulation.	Acute hectic. Low remittent, and adynamic states of fever, often attended by phlebitis or purulent deposits in the viscera or joints.
II. Conditionally perpetuating Infections. — *Contaminating infections.*	i. *Animal effluvia.*—Producing diseases propagating the same or similar maladies in favourable circumstances. *Conditionally and consecutively infectious*, chiefly by means of diffusive and impalpable emanations.	1. Effluvia from animal matter or from vegeto-animal matters during decomposition, aided by humidity.	Adynamic or pernicious remittents. Continued fevers. Adynamic dysentery. Cholera. Gastric, mucous, or enteric fevers.
		2. Emanations from living bodies in close or unventilated situations.	Adynamic putro-adynamic, and malignant fevers. Malignant dyssentery.
		3. Emanations from the secretions and discharges of the sick confined in close apartments, &c., and the direct application of these secretions.	Erysipelas. Hospital gangrene. Phlebitis. Puerperal fever.
	ii. *Animal secretions and septic animal matters.* —Infectious chiefly by contact, or inoculation of a palpable matter; *chiefly sporadic.*	1. Morbid secretions in recently dead bodies.	The irritative fever, or malignant effects produced upon opening recent bodies, by the morbid secretions poured out in serous cavities.
		2. Animal matter in a state of putridity or decomposition.	Diffusive or disorganising inflammation of cellular parts. Inflammation of lymphatics of veins, &c.
		3. Morbid secretions communicated from the lower animals by contact or inoculation.	Glanders. Farcy malignant pustule and other affections arising from contaminating diseases in the lower animals.
		4. The poisonous bites of insects and reptiles.	General vital depression, and septic disorganization, or solution of the vital cohesion of the tissues.
III. Specific Infections. — Infections immediately or mediately disseminating and perpetuating their kinds, by a morbid impression, or by contamination, or by both. Capable of retention and communication by Fomites.	i. *Impalpable specific infections* of susceptible persons. Diffusive or volatile infections, frequently epidemic.	Emanations from the secretions, excretions, and surfaces of persons already affected. — Propagating their kind by a diffused and impalpable effluvium, or vapour.	Epidemic and exanthematic typhus. True yellow fever. Pestilential cholera. Pertussis.
	ii. *Palpable specific contagions.* Consistent contagions.	A specific secretion or virus from the seat of disease perpetuating maladies always presenting the same characters.	Rabies. Syphilis. Gonorrhea. Scabies. Yaws. Sivvens. Frambœsia. Purulent or Egyptian Ophthalmia. Cow-pox. Pellagra. Porrigo.
	iii. *Infectious both diffusive and consistent.*—Often epidemic.	Diffusive and impalpable emanations, and consistent secretions, from the bodies of the infected, either of which may produce the same disease.	Chicken-pox. Scarlet fever. Small-pox. Measles. Malignant puerperal fever. Plague.

5.—I. The Sources of Infection.—According to the extensive sense in which I have employed the term infection, its sources or agents are numerous and diversified. They may be arranged —1st. Into Idio-infectants, or those which produce diseases incapable of perpetuating their kinds, unless other causes be superadded; — 2d. Into those which produce maladies which may be propagated under favourable circumstances — or into *conditionally perpetuating infections*; — and 3d. Into *Specific Infections*, or those which produce diseases which perpetuate their kinds, both immediately, and mediately by *fomites*.

6. i. — Under the First Class may be arranged those infections derived from (*a*) endemic sources; — (*b*) from the ingesta; — and (*c*) from morbid matters generated in the body, and conveyed into the circulation, thereby contaminating the whole frame. The diseases proceeding from these sources never give rise to the infection of the healthy, unless they are modified in their characters by superadded causes, or unless they are materially influenced by determining or consecutive circumstances. — A. The *miasms or exhalations from the soil* produce a great variety of diseases according to the temperature and humidity of the air, and the quantity or activity of the miasms floating in it; but the diseases thus produced will not propagate themselves. If, however, other causes are superadded, — if the persons labouring under disease from this source be confined in ill-ventilated apartments, or breathe a close air

loaded with animal exhalations, the disease may change its form, and assume some one or other of those which arise from the *second class* of causes — from animal effluvia,—and thus become consecutively and conditionally infectious. I could adduce numerous instances of diseases, originating in local or endemic sources, becoming thus infectious. Livy adduces more than one instance of it; and numerous others are furnished in the medical histories of wars and campaigns; but unfortunately the circumstances connected with them have rarely been recorded with precision, and sometimes not even with impartiality.

7. *B.*—The *use of unwholesome food* infects the body with disease, which is not capable of being communicated to the healthy under ordinary circumstances. But persons affected with diseases from this source may be exposed to additional causes which will change the character and course of these diseases, and give rise, as in the foregoing instances, to a truly infectious property. It is well known that unwholesome and scanty nourishment will produce scurvy, scorbutic dysentery, and low or adynamic fevers. These fevers are generally not capable at first, or as they immediately proceed from this cause, of propagating their kinds, but they frequently assume this character, owing to states of the air, to insufficient ventilation, and to the manners and imperfect civilization of those amongst whom they occur. Proofs of this were furnished in Italy and France during 1815, 1816, and 1817, — at Marseilles in 1812, and 1813, —in Ireland during various periods, particularly since the commencement of this century, and even in the present day in some parts of England. The disease which prevailed in the Penitentiary, and which was so ably described by Dr. Latham, and the fevers now prevalent among the poor, are proofs of the infectious characters which distempers thus originating generally assume. I am convinced that the low dietaries assigned to the poor in the Union workhouses, in connection with crowding, and with imperfect ventilation, in many of them, have been a chief cause of the present prevalence of typhus throughout the country. And although the infectious visitation may not have reached those who have been the prime movers in the iniquity, yet it may overtake some of them with no measured retribution. Persons who require the aid of the Poor Law have usually as respects food or drink, and sometimes as regards both, lived fully or intemperately; and when they are subjected to a diet, altogether insufficient for the continuance of health even in the temperate, low fever, which readily propagates its kind among the predisposed, and on occasions favouring communication, soon makes its appearance. This result the more certainly follows, when numbers are similarly circumstanced, and placed in buildings possessing no thorough ventilation or perflation of air. The only recently erected Union workhouses which I have seen, are most improperly planned, inasmuch as they have windows only looking into the interior of the Court, of which they form three of the sides. This is shameful if it proceed from ignorance, and flagitious if it be done designedly. We can hardly suppose architects so ignorant of the most generally acknowledged principles of their art, as to neglect ventilation where it is most required. Are we therefore to consider that they have been controlled by those who have sacrificed feelings of humanity to the expediency of political economy?

8. — From considerable observation and reflection, I infer that disease may take place sporadically, or from local causes; and owing to various circumstances acting either in close succession or coetaneously, the circulating and secreting fluids, and even the soft solids, may be so changed during its course, as to emit an effluvium contaminating the surrounding air and thereby infecting many of those who breathe this air in a sufficiently contaminated state; and thus the disease will be propagated to several, and from these to others, especially under favourable circumstances of temperature, humidity, electrical conditions and stillness of the air, and of predisposition on the part of those who come within the focus of infection. Thus diseases may become *infectious*, and, when aided by the constitution of the air, and other circumstances, even *epidemic*. After thus spreading for a time, they may cease or entirely disappear with the circumstances which combine to propagate them.

9. *C.* — The *Self-contaminating agents*, or morbid matters formed in a part, and afterwards infecting the system generally, but seldom, perhaps, give rise to disease, capable of propagating its kind. When sanious or purulent matters are carried into the circulation, the consequent alteration in the blood gives rise to phenomena closely resembling typhoid or low fevers in many cases; but I do not believe that the malady thus produced will infect the healthy, unless under circumstances peculiarly favourable to infection, as in puerperal females, in the wards of lying-in hospitals. I think it extremely probable, that the sanious fluid constituting the lochia may be absorbed or imbibed from the surface of the uterus, particularly when the uterus contracts imperfectly, or when the discharge is retained or accumulates, and when vital power is much depressed, and that the consequent pollution of the circulating and secreted fluids will give rise to an effluvium which may produce puerperal fever in a female recently confined, if she come within the focus of infection. It is not improbable, that erysipelas also may be excited by the effluvium emitted from a person thus diseased. I attended with another practitioner, a case of dangerous puerperal fever of this kind. A lady visited this patient, and leant close to her mouth, so as to hear her faint articulations, but perceived her breath so offensive, and felt it produce so unpleasant a sensation on her own face, as to induce her to remove to a greater distance. This lady continued to perceive the unpleasant odour, and to feel the sensation in the face until the following day, when she experienced chills with swelling and redness about the nose, extending over the face: — a complete attack of erysipelas followed.

10. That the morbid secretions of persons affected with low fever, consequent on the absorption of morbid matters, into the circulation, will infect the healthy frame when inserted into a wound or under the cuticle, or even when applied to a mucous surface, is by no means improbable. I have seen the most dangerous diseases arise, from the inoculation, and even from the contact of the fluids during the examination of the bodies of females, who had died of puerperal disease, caused

by the passage of sanious or morbid secretions into the circulation, as well as by the influence of an impure air. The danger of infection or inoculation from these cases is great in proportion to the shortness of time that has elapsed from dissolution; and it is particularly great when the body still retains some of its warmth. The above considerations and facts prove that, although the several orders of agents comprised under the *first class* produce merely a sporadic form of infection, or infect merely those exposed to their sources, and give rise to diseases generally incapable of propagating their kind, yet the concurrence of additional causes or influences, during their course, will develope a disease capable of being communicated to the healthy under circumstances of predisposition, and in similar modes, as well as by the same media, as the diseases produced by the class of agents next to be noticed.

11. ii. *The second class of agents. A.* Effluvia from *animal exuvia* and *animal secretions and excretions* directly occasion those forms of disease which infect the healthy by contaminating the surrounding air. The particular *form* or *species* of malady thereby produced, depends much upon the nature of concurrent causes — upon the concentration or accumulation of the effluvium, — upon its sources, — upon its admixture with miasms from decayed vegetable substances,—upon the temperature, humidity, and electrical states of the air, — upon the susceptibility or state of predisposition of those exposed to it, — and upon pre-existing disorder. The operation of some of the sources of infection falling under this head has been disputed. Dr. Bancroft, by a laboured special pleading, has denied the injurious influence of putrifying animal substances; but much depends upon the temperature in which this process takes place, the concentration of the emanations arising from this source, and epidemical states of the air. When the temperature is low, and ventilation is preserved, no very acute or sudden disease results from this cause, particularly to those accustomed to it, although a gradual loss of health generally follows its continued or frequent influence. But in other circumstances, particularly when aided by concurrent causes and marked susceptibility, febrile diseases of a low or adynamic form, and of an infectious character, where free ventilation is not preserved, generally appear. The emanations from the lower animals, as horses and cattle, crowded in ill-ventilated places, produce infectious diseases, not only amongst them, but also in those of the human species, who may breathe for some time the air which is thus contaminated. Livy, Dionysius of Halicarnassus, and Orosius, mention a destructive disease which appeared in Rome 464 years before Christ. Livy states that it occurred in Autumn from the crowds of countrymen and herds of cattle received within the walls of the city; that it was aggravated by the infection arising from the crowded state of the close buildings, by the heat and want of rest; and moreover that the disease was propagated by contagion and by the attendants on the sick. The same historian records that, in the 325th year from the foundation of Rome, a remarkable drought and famine extended throughout the Roman territory: that diseases followed, first invading cattle, and afterwards infecting the rustics and lower classes of people, and then extending to the city. That disease of an infectious nature may be developed in the lower animals by their confinement in close or ill-ventilated places has been proved on numerous occasions; and there is no reason to doubt the possibility of the distemper thus produced being communicated to the human species. A number of horses shut up in the hold of a transport will generate glanders in some of them, the morbid secretion of which will communicate a similar disease to persons employed about those which are affected, especially if it come in contact with the mucous surfaces. It may be stated as an axiom, that the foul air generated by the crowding of many persons or animals into a confined space, even in health, but more especially in disease, as in the wards of hospitals, &c.; or by a few persons only in the same apartment, if their diseases be attended by copious discharges, will infect those who breathe it in a state of predisposition, with low fever, dysentery, &c.; and that the persons thus infected will communicate the malady to others similarly predisposed. Although animal effluvia infect the healthy chiefly by their diffusion in the atmosphere, yet the infection will not take place, unless near their sources, or in situations where they become concentrated. Much, however, will depend upon the predisposition or susceptibility of persons exposed to them.

12. *B.* Certain maladies do not perpetuate themselves by effluvia or by an impalpable emanation, but by *the contact of the secretions formed in their course;* and these secretions will seldom induce disease unless they be inoculated, or come in contact with a mucous surface. Other secretions, particularly from diseased animals, when brought in contact even with the unabraded skin, will sometimes produce serious distempers. Instances of this fact are furnished by the malignant pustule, and by other maladies already noticed. The inoculation of putrid animal matters, and the bites of poisonous reptiles, infect or contaminate the whole frame in a sufficiently remarkable manner, the former agents producing a low, irritative, or adynamic state of fever; but the diseases thus produced seem incapable of propagating their kind, unless by the inoculation of morbid matters formed in their course, or taken from the body after death; and then the effects will probably vary with the previous state of health of the person thus infected, and with various concurrent circumstances.

13. iii. Of *the Third Class of Infectious Agents.* It is unnecessary to add any thing to the statement contained in the classification of these agents, which I have attempted. The impalpable emanations and consistent secretions of which they consist, produce specific forms of disease, whether they operate *directly* or by various *media,* or *fomites.* But, although the chief characters of these maladies are uniformly preserved, in all of them, during their transmission, yet several of them are much modified by concurrent causes, by the circumstances, or existing states, of the affected, and by endemic and epidemic influences.

14. II. Of the Proofs of Infection, *or the circumstances proving a disease to be capable of propagating its kind.* It has been asserted by some recent writers, that the doctrine of infection, by contact or otherwise, is a comparatively modern invention. These assertions have been made by

persons possessed neither of sufficient medical learning nor practical information, to attach any degree of importance to their opinions. It has been satisfactorily shown by Dr. Yeats in this country, by Dr. Marx in Germany, and Dr. Omodei in Italy, that the doctrine of contagion was recognized by the ancient Egyptians and Jews, by the Greeks and by the Romans: and that it was equally believed in during the middle ages, although the notions of many respecting it, even among professional writers, were often loose and inaccurate It is unnecessary to adduce proofs of the acquaintance of the ancients with contagion, as this has been done so satisfactorily by the writers just mentioned. Some evidence also on this subject will be found in the article Epidemic Influence. Indeed the matter would never have been questioned, had not commercial men, in order to remove some impediments in the way of their traffic, properly imposed for the public good, employed persons to write in favour of their interests; but with an ability and success quite commensurate with the truth and justice of their cause. The question, however, as lately agitated, is not so much the existence or non-existence of infection or contagion in any circumstances, and as respects all diseases, for proofs of the possession of these properties by certain maladies are so incontrovertible, as not to be doubted. It is principally with respect to the infectious nature of pestilential epidemics, as plague, yellow fever, and epidemic cholera, that the subject has created so much interest and discussion at the present day. When we consider the extent to which the dread of the importation of these maladies impedes commercial undertakings, in connection with the little consideration human life receives in the prosecution of commercial objects, it is not likely that the contingent importation of infection will operate in such a manner, as long to prevent attempts at the removal of existing salutary restrictions; although the *proofs* as to the existence of an infectious property in these distempers, are considered quite conclusive by all candid inquirers.

15. i. There are various circumstances which, singly or conjoined, *prove* a disease to be *truly infectious*, or capable of propagating itself. — 1st. The arrival in places which are healthy of persons from districts in which a disease is prevalent, and the spread of such disease soon afterwards in the previously healthy place. — 2dly. The extension of such disease in this place, in proportion to the intercourse between the affected and the healthy. — 3d. The greater prevalence of such disease amongst persons who devote themselves to its alleviation, as amongst medical attendants, nurses, and the friends of the sick. — 4th. The absence of any other cause to which the malady may be attributed, the soil, the climate, the season of the year, the weather, neither singly nor conjointly, serving to account for it. — 5thly. The immunity obtained by seclusion and by avoiding communication with the sick and those who have visited them, as well as by the careful exclusion of all substances which may have imbibed and retained the emanations from the affected. — 6thly. The success of measures taken to prevent the extension of the malady, as the early removal of the sick to places where communication with the healthy is prevented. Besides these, there are other proofs, which are even more conclusive. When we perceive the healthy become affected with a malady, soon after proximity to, or contact with, a person labouring under a similar malady, or after having been exposed to substances which have imbibed the effluvium from the sick, as bed and body-clothes, &c., the evidence of infection from these sources, although not amounting to complete certainty, yet nearly approaches it. Instances of contagion by *inoculation*, and by immediate or direct communication with the sick, are sufficiently numerous in respect of several maladies, and are familiar to all: and the evidence of infection by substances which have imbibed a morbid effluvium or secretion — by *fomites* — is not less strong, although it is in some cases not so conclusive, and hence it has been more frequently impugned. It has been satisfactorily shown to all candid minds, and numerous instances have occurred to my own observation, of a disease having been conveyed in the clothes of a second person, and communicated to a healthy individual. That this has occurred with respect to certain maladies acknowledgedly infectious, cannot be disputed by the most captious objector. The only questions admitting of doubt are, — to what diseases should this capability of propagation be extended: and for how long a period, and under what circumstances, may the infectious effluvium be thus retained and conveyed. Some answer to the first of these questions will be obtained by what is hereafter to be advanced; as to the second, it is impossible, from the nature of the subjects involved in it, to furnish precise information. There is every reason however to state, that the body-clothes or bedding, used by a person while sick of an infectious disease, may communicate the same malady several or even many months afterwards, if they have been shut up from the air; and I have known several instances of a disease being conveyed from the sick to the healthy, the person, who has been the medium of communication, having walked a distance of upwards of two miles in thus conveying it.

16. ii. *Of the media by which infectious agents are communicated to the healthy frame.*—*a.* The *miasms* or *mephitic vapours*, exhaled from the sources already enumerated, are evidently suspended, and rendered active, by the humidity of the atmosphere, in the situations in which they are disengaged: for it has been repeatedly shown, that these miasms are active in proportion to the grade of atmospheric humidity, and to the circumstances which augment that humidity. Their presence in the air brings them in contact with that part of the animal economy, presenting the greatest extent of surface, the greatest vascularity, and the freest communication with the circulating system. Although the atmosphere, aided by humidity and a moderate or high range of temperature, is the usual medium of infection, especially in respect of those maladies, which emit an offensive effluvium or emanation; yet there are other media which observation has shown to be not infrequent means of communication. Numerous substances imbibe, retain for a considerable time, and convey, the invisible or *infectious* emanations, as well as the palpable and *contagious* virus, or consistent secretions of the sick, and become media, by which infection is conveyed from one person or from one country to another, between

whom a greater or less distance is interposed. Of the various materials, which may thus be the means of transmitting infectious diseases, animal productions, particularly woollen and hairy substances, bedding and body-clothes, furs and feathers, have the greatest disposition to imbibe and to retain the morbid effluvium. The *length of time*, during which the morbid *seminium* may thus be retained and still be operative, has never been accurately determined. Probably the period varies with the disease from which it proceeds. There can be no doubt that it depends much on the exclusion of the atmosphere, and upon the temperature to which it has been exposed.

17. *b.* When infection is produced by substances which imbibe and retain the morbid effluvium or secretion, it does not arise from actual contact with the substance which is thus the medium of communication, unless it conveys a more or less consistent virus or secretion. The substance imbued with the morbid effluvium retains it whilst shut up from the air for a longer or shorter period, but more or less readily imparts it when exposed to the atmosphere, which now becomes the infecting medium. Even the clothes of an attendant upon a person labouring under an infectious disease, will retain the morbid emanation much longer than is generally supposed. There are few who will dispute the fact of infectious diseases being often communicated in the clothes of medical men, and other attendants on the sick. I have known several instances of small-pox, puerperal fever, and pestilential cholera, being thus propagated. I was recently called to the wife of a physician in the most malignant form of small-pox, conveyed to her by her husband whilst he was in attendance on a case of this disease at a considerable distance from his own residence. Sometime ago I was requested by a practitioner in extensive midwifery practice, to see a case of true puerperal fever. He had, within a few days, lost five patients from this malady. I asked him to consider whether he might not have been the medium of communicating the disease to most of them. Before my attendance on this case terminated, he expressed his conviction that he had communicated the malady to four at least of the six. Similar instances have been mentioned to me by other obstetric practitioners. — I am convinced of having conveyed the infection of pestilential cholera in my clothes, in two instances.

18. *c.* The infection or contamination caused by ingesta, or by substances used as food and drink, is generally not so rapid in its progress or so dangerous, as when the infectious agent acts through the medium of the air upon the lungs, or when it is conveyed into the system by inoculation. Some, however, of the more active poisons may be said to furnish exceptions to this law, but they hardly come within the present category. Unwholesome articles of food generally infect the system by a succession of morbid changes requiring more or less time for their developement; and much of their baneful effects is counteracted by the vital influence and resistance of the stomach, and by the changes produced by the gastric juices. Still, in proportion to the injurious nature of the substances received into the stomach, will the organic nerves be morbidly impressed, or the chyle and blood contaminated, by the noxious fluids or matters absorbed from the digestive canal, or both kinds of disorder be induced, the effects varying with the activity of the injurious agent, and the duration or repetition of its operation. A morbid emanation, which would produce an immediate effect upon being inspired with the air, will be quite inoperative when received into the stomach mixed with the saliva: and a morbid secretion or virus, which would be followed by the most dangerous results when inserted under the cuticle, may be swallowed with impunity. The matter of small-pox will produce no effect when conveyed into the stomach of a person, who will be readily infected by the effluvium or the virus of the disease; and the same obtains with respect to other contagious maladies. The immunity from the one medium of communication, and the ready operation of the others, are accounted for by the structure and functions of the organs and parts to which the infecting agent is applied. From this the ignorance of pathological principles displayed in the silly and disgusting attempts to prove certain maladies to be non-infectious or non-contagious, by tasting or swallowing the secretions to which they give rise, will be sufficiently evident.

19. *d.* In cases of general infection of the frame, resulting from a local source of contamination existing in the body itself, the media of infection may be readily inferred. Cancerous, sanious, or purulent matters may be formed in a part of the body; and as long as nervous power, and vital resistance are not materially depressed, either the mischief is limited, or attempts are made at throwing it off; but as the system becomes weakened, the disease extends, absorption takes place, the morbid matter carried into the circulating vessels vitiates the blood; and hence arise imperfect and disordered secretion and excretion, insufficient digestion and assimilation, and a general infection of the fluids and solids of the body.

20. *e.* The *effluvia* or *emanations* from a number of persons even in health, shut up in a confined space, or in ill-ventilated apartments — from the lower animals similarly circumstanced — from the sick in crowded wards, &c. — and from those with infectious or contagious diseases, generally operate almost entirely through the medium of the atmosphere, and with an activity in proportion to the humidity of the air, and to the accumulation of the noxious effluvium, relatively to the susceptibility or degree of predisposition of those exposed to its action. But as all the emanations from the sick consist in a great part of watery vapour, even a dry air, if it be not quickly renewed, will at length become so moist, as to be soon as injurious as that which was already humid. Moisture favours the developement of infectious emanations, increases the activity of all of them, and heightens the predisposition of persons exposed to them. Experience has shown that the emanations from the sick seldom infect the healthy, whilst the air is dry, cool, and freely renewed; that infectious diseases seldom occur or appear only sporadically in such circumstances; and that these diseases generally prevail or become epidemic in warm, humid, and stagnant states of the atmosphere. The crowded wards of hospitals, ships of war and transports, generally continue healthy, as long as dryness and freshness of the air are preserved. But as soon as these requisites to health are neglected; when the floors of the former, or the decks

of the latter are frequently washed, so as to render the air moist; the emanations from the healthy as well as from the sick readily accumulate or acquire activity. Fevers, dysentery, scurvy, erysipelas, and even hospital gangrene or phagedenic ulceration and phlebitis, will thus be developed or rendered prevalent.

21. *f.* Although there are various agents which infect the body in a certain determinate mode or medium, — as typhoid and exanthematous fevers, by the emanations proceeding from those affected by them floating in the air, — syphilis, by contact, — rabies, by inoculation, &c., — yet there are others, as arranged above, which operate in more than one, or by all these modes. There are some sources of infection respecting which we are still insufficiently informed as to the several modes or media of their action. A person on opening a recent body that has died of peritonitis, may have a pustular or erysipelatous inflammation of the skin of his hands, with smart fever produced, although there has been neither puncture nor abrasion of the cuticle, and if either has existed his life will be placed in the utmost jeopardy. Mr. Kiernan informs me that he has even seen, from the inspection of cases of this description, very severe constitutional disorder produced in those who had never touched the bodies which were examined. In these instances, the effluvium exhaled from the peritoneal cavity or from other internal parts, upon first exposing them, must have infected the system.

22. III. The Effects, or the Diseases, produced by Infection vary with the sources and modes of infection, with the concentration or intensity of the infectious agents, and with the predisposition or susceptibility of the persons exposed to them. Certain of these agents produce a determinate effect, or a specific form of disease, particularly those comprised under the third class. — *A.* It has been supposed, that the terrestrial miasms or mephitic vapours, emitted by marshes and other sources of malaria, produce only intermittent and remittent fevers. Some writers, however, have contended that true yellow fever, and even plague, also spring from these sources, aided by the influence of high ranges of temperature and an epidemic state of the air. That terrestrial miasms are capable of producing, under these circumstances, pernicious or malignant forms of fever, which assume either a remittent or a continued type, according to concurring causes and the state of the patient, I will readily admit; but that they occasion either true yellow fever or plague, is an assumption founded on preconceived and fallacious views, which every circumstance connected with the origin and pathological relations of these maladies fully disprove. (See Art. Pestilences.)

23. That malaria, however, produces a wider range of diseased action, than has been long supposed, I will allow; for I agree with much that has been advanced by Dr. Macculloch on this subject, and believe, that the less concentrated states of terrestrial exhalation, particularly in low grades of atmospheric temperature, will give rise to several diseases usually imputed to other causes, — as to catarrhs or catarrhal fevers, rheumatism, neuralgic affections, sciatica, obstructions of glandular organs and premature decay. When terrestrial exhalations are concentrated or rendered more active by a warm and humid air, bilious inflammatory remittents, gastric or mucous fevers, cholera, dysentery, and visceral diseases will frequently result, according to the existing disposition or states of those exposed to them.

24. *B.* The contaminating effects of unwholesome kinds of food and drink frequently declare themselves in specific forms and modes. Ergotism, gangrenous ergotism, scurvy, scorbutic dysentery, adynamic dysentery, &c., are illustrations of this. On many occasions, however, the ingesta constitute only one of the sources of infection, or other causes concur with this in producing the effect. Mucous, gastric, and putro-adynamic fevers and dysenteries, even when chiefly occasioned by septic or diseased articles of food, or by water containing putrid animal matter, are often aided in their appearance by additional causes: when foul water is concerned in the production of septic or adynamic maladies, animal or vegetable exhalations, or both, and unwholesome food, frequently co-operate with it. The fevers and dysenteries so generally developed in armies, in besieged towns, &c., seldom proceed from a single source of contamination only. When they assume highly infectious and typhoid forms, it will generally be found, that putrid and impure food and water, exhalations from animal exuviæ, and from the surrounding soil containing numerous dead bodies imperfectly covered with the earth, famine, fatigue, and the depressing passions, first contaminate the frame; and that the exhalations from persons confined in close places, and from those first affected by those causes, heighten still further the morbid effects, until a most malignant malady is produced. It is extremely probable, that the air of a place thus circumstanced, and especially the moisture floating in it, may become so saturated with noxious effluvia derived from these sources, as to assume a pestilential character; the infection extending to nearly all who breathe it, but becoming less remarkable, as the distance from the focus of infection increases. Hence it is, that in large, crowded, or populous cities, particularly in seasons when the temperature is high and the air humid, and is already contaminated by the circumstances which necessarily attach to them, and especially by exhalations from animal exuviæ and burying places, the infectious emanations from the persons first attacked by the resulting febrile maladies heighten the existing aerial contamination, produce a more marked effect, and more readily spread the malady in these places than in those differently circumstanced. During the pestilence in Rome, during 262 and 263, the air is stated by Eusebius and Cedrenus to have been so contaminated by the emanations from the sick and dead, that the dew which fell in the mornings and evenings presented a sanious or putrid appearance on the surface of objects. It is chiefly owing to this circumstance that when an infectious disease becomes very destructive, or assumes a pestilential form in crowded cities, it seldom spreads extensively in districts far removed from them, although it is generally communicated to a greater or less extent to the healthy, by those who have left the source of infection, and by *fomites;* for the circumstances favourable to the infection are there wanting.

25. That continued fevers of a low, adynamic, typhoid, or putro-adynamic character, dysentery, erysipelas, hospital gangrene, phlebitis, puerperal fever, diffusive or disorganizing inflammation of cellular parts, and the diseases enumerated in

PREPARING FOR PUBLICATION,

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II. The Preface, *with a Pathological Classification of Diseases, &c.*, forming a Key to the Systematic Study of Practical Medicine, as well as an arranged Table of Contents of the Work, will accompany the last Part.

III. An Index of the individual topics comprised under the various Chapters and Sections of each Article will also be given in the last Part.

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